Series 1960, No. 2

Issued June 1963

SOIL SURVEY

Hardin County Tennessee

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
TENNESSEE AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Hardin County, Tenn., will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodlands; and add to our knowledge of soil science.

Locating soils

Use the index to map sheets at the back of this report to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they occur on the map. The symbol is inside the area if there is enough room; otherwise, it is outside the area and a pointer shows where the symbol belongs.

Finding information

This report contains sections that will interest different groups of readers, as well as some sections that may be of interest to all.

Farmers and those who work with farmers can learn about the soils in the section "Descriptions of the Soils" and then turn to the section "Use and Management of the Soils." In this way, they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The "Guide to Mapping Units" at the back of the report will simplify use of the map and report. This guide lists each soil and land type mapped in the county, and the page where each is described. It also lists, for each soil and land type, the capability unit and woodland group, and the pages where each of these is described.

Foresters and others interested in woodland can refer to the section "Woodland Uses of the Soils." In that section the soils in the county are grouped according to their suitability for trees, and factors affecting the management of woodland are explained.

Engineers will want to refer to the section "Engineering Uses of the Soils." Tables in that section show characteristics of the soils that affect engineering.

Scientists and others who are interested will find information about how the soils were formed and how they were classified in the section "Formation, Morphology, and Classification of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Hardin County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the Area," which gives additional information about the county.

* * * * *

Fieldwork for this survey was completed in 1960. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. This survey was made cooperatively by the United States Department of Agriculture and the Tennessee Agricultural Experiment Station. The soil survey of Hardin County was made as part of the technical assistance furnished by the Soil Conservation Service to the Hardin County Soil Conservation District.

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Contents

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SOIL SURVEY OF HARDIN COUNTY, TENNESSEE

BY WILLIAM H. PROFFITT, THEODORE R. LOVE, EUGENE T. LAMPLEY, OLIVER W. RICE, AND BOBBY B. HINTON, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE TENNESSEE AGRICULTURAL EXPERIMENT STATION

HARDIN COUNTY is in the southwestern part of Tennessee (fig. 1). The total land area is 587 square miles, or 375,680 acres. An additional 17 square miles, or 10,880 acres, is covered by water. Savannah, the county seat, is located on the banks of the Tennessee River near the center of the county. It is about 100 miles east of Memphis and 105 miles southwest of Nashville.

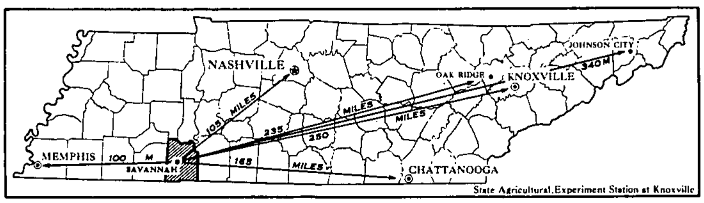

Figure 1.—**Location of Hardin County in Tennessee.**

Farming is the main occupation, and cotton is the chief source of farm income. The leading livestock enterprise is the raising of swine, but beef cattle are raised for market on several farms. Little dairy farming is done, except for home use.

How Soils Are Named, Mapped, and Classified

Soil scientists made this survey to learn what kinds of soils are in Hardin County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down to the rock material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Dexter and Pickwick, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in natural characteristics.

Many soil series contain soils that are alike except for texture of their surface layer. According to this difference in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Pickwick silt loam and Pickwick silty clay loam are two soil types in the Pickwick series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Pickwick silt loam, 2 to 5 percent slopes, is one of several phases of Pickwick silt loam, a soil type that ranges from nearly level to steep.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries on aerial photographs. They used photos for their base map because these show woodlands, buildings, field borders, trees, and similar detail that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientist has a problem of delineating areas where different kinds of soils

are so intricately mixed, and so small in size, that it is not practical to show them separately on the map. Therefore, he shows this mixture of soils as one mapping unit and calls it a soil complex. Ordinarily, a soil complex is named for the major soil series in it, for example, Dandridge-Needmore complex, 8 to 12 percent slopes.

The soil scientists may also find that the differences between two soils are sometimes too small to justify separate recognition, even though the soils are not regularly associated geographically. Therefore, the soils are shown as one mapping unit, or as an undifferentiated group. The unit is named for the major soil series in it, for example, Cuthbert and Susquehanna soils, 5 to 12 percent slopes.

Also, in most mapping, there are areas to be shown that are so rocky, so shallow, or so frequently worked by wind and water that they cannot be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Gravelly alluvial land or Swamp, and are called land types rather than soils.

Only part of the soil survey was done when the soil scientist had named and described the soil series and mapping units, and had shown the location of the mapping units on the soil map. The mass of detailed information he had recorded then needed to be presented in different ways for different groups of users, among them farmers, managers of woodland, and engineers.

To do this efficiently, he had to consult with persons in other fields of work and jointly prepare with them groupings that would be of practical value to different users. Such groupings are the capability classes, subclasses, and units, designed primarily for those interested in producing short-lived crops and tame pasture; woodland suitability groups, for those who need to manage wooded tracts; and the classifications used by engineers who build highways or structures to conserve soil and water.

General Soil Map

After studying the soils in a locality and the way they are arranged, it is possible to make a general map that shows several main patterns of soils, called soil associations. Such a map is the colored general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic, although not strictly uniform.

The soils within any one association are likely to differ greatly among themselves in some properties; for example, slope, depth, stoniness, or natural drainage. Thus, the general soil map does not show the kind of soil at any particular place, but several distinct patterns of soils. Each pattern, furthermore, contains several kinds of soils.

Each soil association is named for the major soil series in it, but, as already noted, soils of other series may also be present. The major soil series of one soil association may also be present in other associations but in a different pattern.

A general map showing patterns of soils is useful for people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use. It does not show accurately the kinds of soils on a single farm or small tract.

The soil associations are discussed in the following pages. More detailed information about the soils is given in the section "Descriptions of the Soils."

1. Shubuta-Boswell Association

Rolling to hilly, well-drained soils in coastal plain sediments

This soil association consists largely of soils that developed in coastal plain sediments on rolling to hilly uplands. Slopes range from about 2 to 40 percent, but are mostly between 5 and 20 percent. The hills are low and irregular, and many of them have broad, smooth tops. Within the area are also low terraces and small areas of bottom lands. The area has a fairly well defined, trellislike drainage pattern. This association makes up 5.6 percent of the county.

The Shubuta and Boswell soils are dominant on the uplands and make up about 65 percent of the association. These soils are deep and are well drained. The surface layer of the Shubuta soils is fine sandy loam, and the subsoil is sandy clay. The Boswell soils also have a surface layer of fine sandy loam, but their subsoil is clay. On some of the broad flats of the uplands are soils of the Dulac series. These soils are moderately well drained and have a fragipan at a depth of about 2 feet.

On the low terraces are soils of the Dexter series. These soils are deep and friable and are well drained. They make up about 10 percent of the association. Soils of the Vicksburg, Collins, Falaya, and Waverly series are on the bottom lands. The Vicksburg soils are well drained, the Collins are moderately well drained, the Falaya are somewhat poorly drained, and the Waverly are poorly drained.

The soils of the uplands are low in fertility, but those of the bottom lands are moderate in fertility. Nearly all of the soils are strongly acid. Much of the area is severely eroded, and many places are cut by shallow gullies.

About 40 percent of this association is in trees. The remainder is used for crops, chiefly corn, cotton, and annual lespedeza. Pines have been planted recently on many of the severely eroded areas. Since only a few livestock are raised in the area, there are few pastures. The average farm is about 120 acres.

Most of the acreage is potentially productive of pasture, and a wide variety of pasture plants could be grown. A fairly large acreage could be used for cultivated crops if suitable cropping systems were used to help maintain the productivity of the soils. Nevertheless, many areas once suitable for crops are now severely eroded. These eroded areas are best suited to pasture or trees because the supply of moisture in the soils is too low for crops to make profitable yields. Large amounts of fertilizer are required for good yields of crops and pasture.

This association is probably best suited to the raising of cattle, which could be supplemented by planting small acreages to corn, cotton, or other row crops. Considering the association as a whole, it is not smooth enough nor productive enough to be used chiefly for cultivated crops.

2. Waverly-Falaya-Freeland Association

Nearly level, poorly drained and somewhat poorly drained, silty or sandy soils on flood plains and low terraces

This soil association consists mainly of poorly drained soils on broad, nearly level bottom lands and low terraces. A fairly large acreage consists of soils that are moderately well drained and somewhat poorly drained. There is only a small acreage of well-drained soils. Most areas are flooded at least once during the year, and a few areas are ponded during most of the year. Areas of this association are in the western part of the county along White Oak, Snake, Lick, and Chambers Creeks. This association makes up 7.4 percent of the county. Figure 2 shows the major soil series in the association and their relationship to the landscape.

The soils of the Waverly series are dominant in this association. In many places they occupy large areas that spread across the entire flood plain. Typically, the soils of the Falaya and Collins series lie alongside the Waverly soils on the flood plains and in local alluvial areas along small drainageways. The Falaya soils are somewhat poorly drained, and the Collins are moderately well drained. The Vicksburg soils, which are well drained, are mostly in long, narrow strips along the channels of the streams. On adjacent low terraces are soils of the Freeland, Hatchie, and Almo series. The Freeland soils are moderately well drained, the Hatchie soil is somewhat poorly drained, and the Almo is poorly drained.

All of the soils are strongly acid and are about moderate in fertility. The texture of most of the soils is silt loam or loam, but it ranges to sandy loam, and in a few places the soils have a texture of loamy sand. On the low terraces the soils commonly have a subsoil of silty clay loam. Clayey soils are not common in the area.

Cottonwood, gum, maple, willow, cypress, and other trees that tolerate wetness occupy only about 10 percent of this association. The rest is used chiefly for corn, soybeans, annual lespedeza, grain sorghum, and cotton. Corn is grown continuously on much of the area, but cotton is commonly grown on the sites that are best drained. Hogs are the main livestock in the area, and much of the grain grown is fed on the farm. The average farm is about 118 acres. Most of the farms extend into the adjacent upland areas.

This area has moderately high potential for agriculture, even though many of the soils are flooded periodically or have poor drainage. Planting is often delayed in spring by wetness. Rains early in fall often make it difficult to use heavy machines for harvesting. The risk of damage to crops by floods is moderate to high.

The soils in this association are better suited to crops than to cattle farming because the areas are too wet and too soft for grazing during much of the year. These soils are well suited to soybeans, grain sorghum, tall fescue, lespedeza, and whiteclover. Cotton and corn make fair to good yields, but the risk of poor stands and loss of the crops because of flooding and poor drainage is fairly high. Yields of all crops could be increased by adding large amounts of fertilizer, and the favorable supply of moisture would make it profitable to add large amounts. If the areas were drained, flooding were controlled, and fertilizer were applied, the soils in this area could be used for crops and would be highly productive.

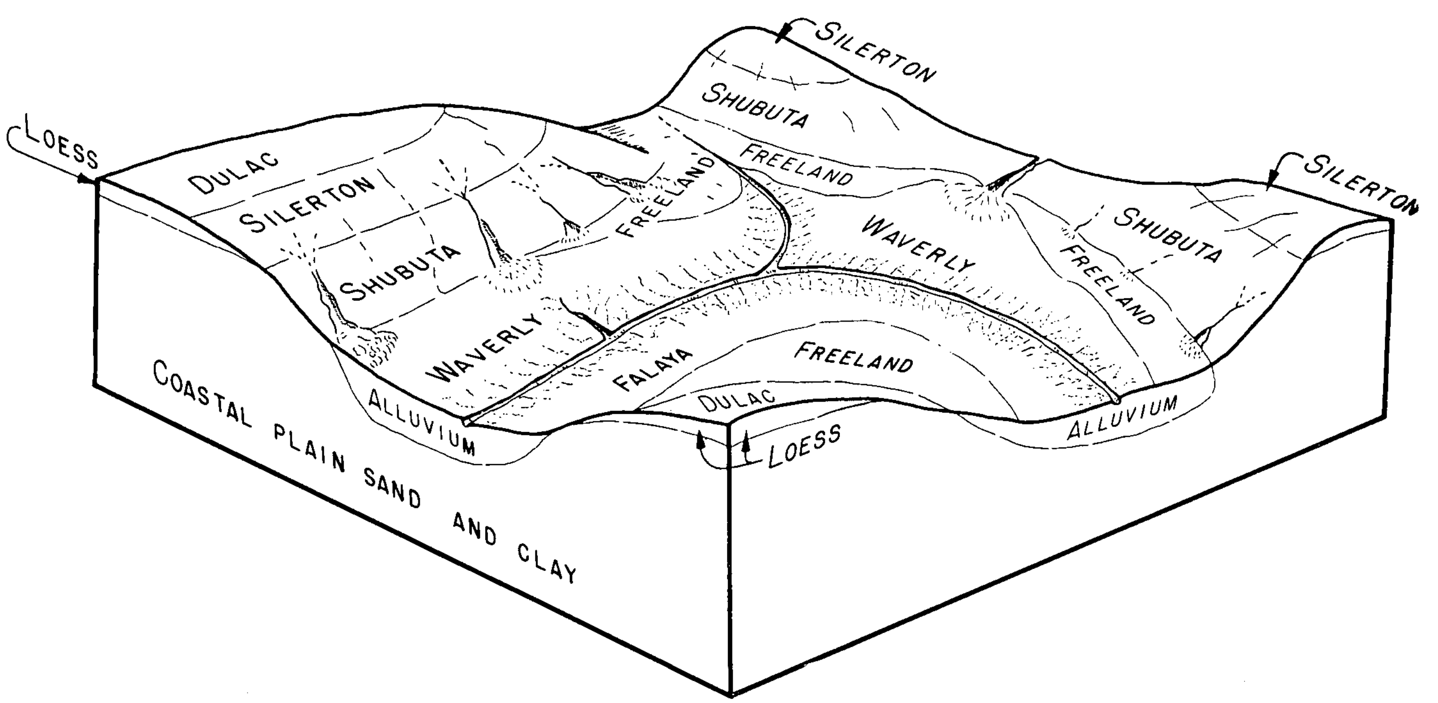

Figure 2.—**Major soil series in associations 2 and 5 of their relation to the landscape.**

3. Paden-Pickwick-Waynesboro Association

Moderately well drained soils and well drained soils on high terraces

This soil association consists mainly of soils on high terraces. The soils are moderately well drained and well drained. They lie along each side of the flood plain of the Tennessee River and extend from the southwestern corner of the county to the north-central boundary. The areas are mainly rolling to hilly, and there are broad upland flats between the shallow drainageways. There are some deep drainageways that have short slopes that are moderately steep to steep. Also, there are small areas of bottom lands. This association makes up 17.7 percent of the county. Figure 3 shows the major soil series in the association and their relationship to the landscape.

About 70 percent of the acreage consists of Paden and Pickwick soils, which occupy areas about equal in size. The Paden soils are on the more gently sloping areas or upland flats and the Pickwick are on the more rolling areas. These soils generally adjoin each other. They developed in a thin layer of loess over alluvium. The Paden soils are moderately well drained and have a fragipan; the Pickwick soils are well drained.

The Waynesboro soils make up about 10 percent of the association. These soils are on steep side slopes and points of ridges where they developed in thick beds of alluvium. In small areas on the bottom lands are the Vicksburg, Collins, Falaya, and Waverly soils. In a few depressions on the uplands is the Taft soil, which is somewhat poorly drained, and the Robertsville, which is poorly drained.

All of the soils are low in natural fertility and organic matter. They are strongly acid. In areas that are not severely eroded, the surface layer is loam and silt loam. The subsoil is chiefly silty clay loam and clay loam. The soils respond well to management, particularly if fertilizer is applied. A large acreage is severely eroded, and many small areas have shallow gullies.

Most of the farms are less than 160 acres, and many are less than 30 acres in size. Much of the farming is done on a part-time basis and is mostly general farming. There is more livestock, especially hogs, raised in this area than in other areas in the county. Much of the corn fed to the livestock is grown on the bottom lands of the nearby Tennessee River.

Nearly all of this area was once cultivated, but now a large acreage is idle or in second-growth trees. Cotton, corn, and annual lespedeza are the main crops.

Individual areas suitable for crops are not large, because they are generally surrounded by soils in steeper areas that are better suited to pasture or trees. Only a small acreage is suitable for cultivated crops. A much larger acreage could be cultivated if medium to long cropping systems were used. A wide variety of pasture plants could be grown on a large acreage. Trees can be grown on the small acreage that is too steep or too eroded for pasture, and they will make fair to good growth.

This association is not well suited to row crops or grain crops; the slopes make it difficult to prevent erosion. Probably this association is best used for raising beef cattle and growing small acreages of row crops to supplement income.

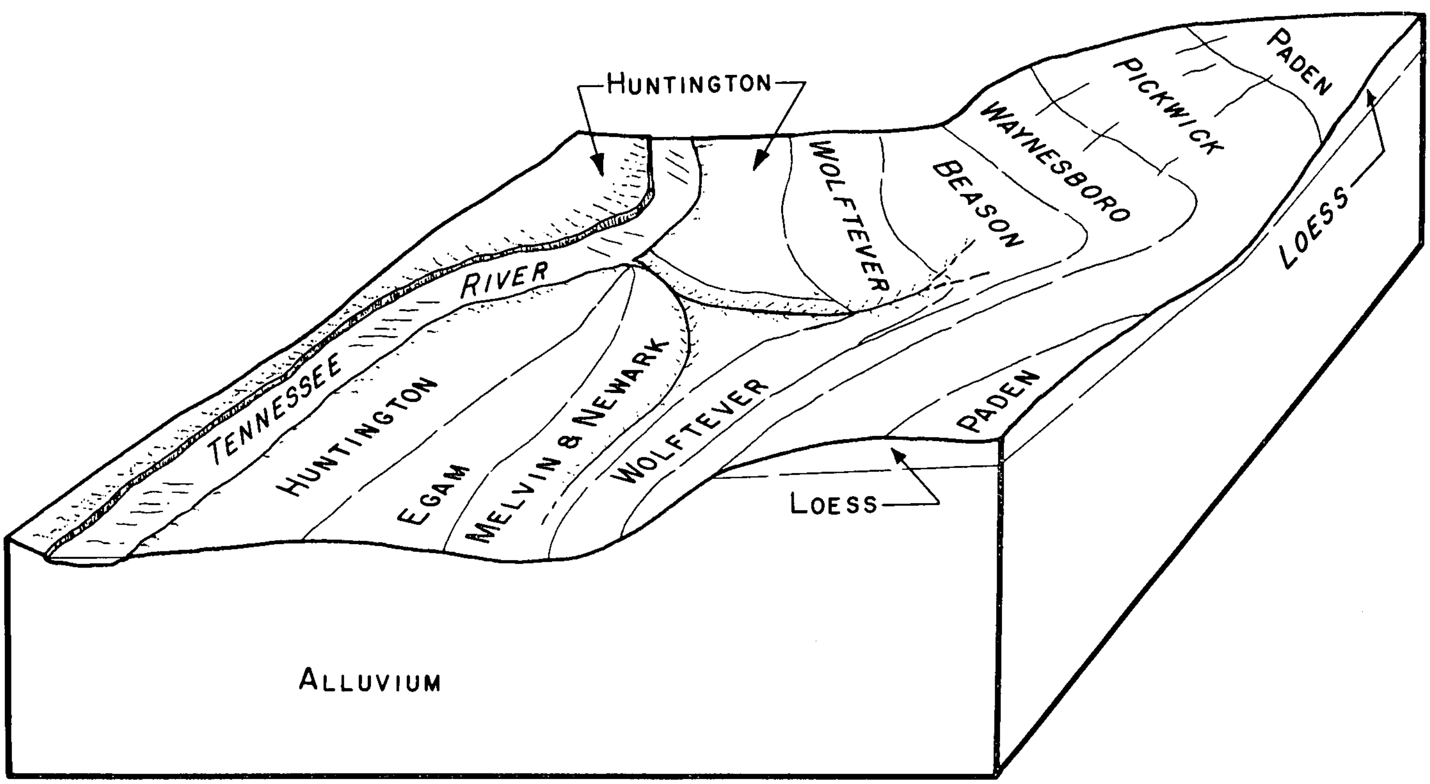

Figure 3.—**Major soil series in associations 3 and 6 and their relationship to the landscape.**

4. Shubuta-Waynesboro-Bodine Association

Well-drained to excessively drained soils on hilly and steep uplands and terraces

The soils in this association are mainly well drained to excessively drained and are on hilly and steep uplands and terraces. This association occupies a wide area from the south-central border of the county to the Tennessee River near Cerro Gordo. The area is made up of choppy hills that are dissected by many shallow and deep drainageways. In some places the tops of the hills will accommodate a 3-acre field, but in other places they are very narrow. The soils developed in a variety of materials. Most of the steep soils contain much chert from the limestone bedrock or rounded gravel from coastal plain materials. This association makes up 27.3 percent of the land area of the county; an additional 2.9 percent is under water.

About 55 percent of this association consists of Shubuta and Waynesboro soils. The Shubuta soils formed in coastal plain sediments. Their surface layer is light-colored fine sandy loam, and their subsoil is red sandy clay. Waynesboro soils are similar to the Shubuta, but they developed in old alluvium and, in places, contain much gravel.

The Bodine soils make up about 20 percent of the association, and the Pickwick, about 15 percent. The remainder consists of soils of the Paden and Dulac series. The Bodine are light colored and very cherty and are mainly on the lower parts of steep slopes. The Pickwick soils are on the upper parts of some of the slopes. These brownish, productive soils developed in a thin mantle of loess over alluvium. On some of the upland flats are the Paden and Dulac soils. These soils are moderately well drained and have a fragipan (dense, brittle layer) at a depth of about 2 feet.

Nearly all the soils of this association are low in natural fertility and strongly acid. Most of the soils respond well if fertilizer is added and other good management is used. In the more cherty and gravelly areas the response would be low because of droughtiness. Many small areas are severely eroded, and some areas have many gullies.

About 85 percent of this association is in cutover forest. The areas that are cleared are largely on the upper slopes and hilltops. On each farm the acreage that is cleared is small. The main crops are cotton, corn, and annual lespedeza. There are few livestock in the area, and, consequently, the acreage in pasture is small.

The potential of this association for agriculture is only moderate. Much of the area is not suited to cultivated crops, because the soils are too cherty or gravelly. Also, the supply of moisture is not sufficient for crops to make good yields. The small areas on the bottom lands can be cultivated frequently, and a wide variety of crops can be grown. Even though they are small, the undulating to rolling areas on the uplands can be cultivated if cropping systems are used that maintain the soil. Much of this association will produce fair to good pastures, and most of the acreage is best suited to pastures or to trees.

5. Shubuta-Silerton-Dulac Association

Well drained and moderately well drained soils on silt-capped, hilly uplands

This soil association consists of silty soils on uplands. The soils are well drained and moderately well drained. The association is in the southeastern part of the county. It consists of choppy, irregular hills that are dissected by many long, crooked drainageways. The area is dominantly hilly, and the slopes along the deep drainageways are steep. There are small undulating or rolling areas on the tops of the hills. Most of the level areas are in narrow strips on the bottom lands. This association makes up 10.4 percent of the county. Figure 2 shows the major soil series in this association and their relationship to the landscape.

About 60 percent of the acreage consists of Shubuta and Silerton soils. The Silerton soils are mainly on the caps of hills, and the Shubuta soils are on the slopes below the Silerton. The acreage of Shubuta soils is slightly larger than that of the Silerton. Shubuta soils developed in coastal plain sediments. They have a surface layer of light-colored fine sandy loam and a subsoil of red sandy clay. The Silerton soils developed in a thin mantle of loess over coastal plain materials. Their surface layer is light-colored silt loam, and their subsoil is reddish silty clay loam.

In the small, nearly level upland areas are the Dulac soils. On the lower part of some of the steep slopes are the very cherty and light-colored Bodine soils and the soils of the Bodine-Guin complex. The Bodine-Guin complex ranges from very cherty to very gravelly within short distances, and, in places, the chert and gravel are mixed together.

Except for those soils on the bottom lands, the soils in this association are low to very low in natural fertility. Nearly all of the soils are strongly acid. In about two-thirds of the acreage, the soils would respond well if fertilizer were added and other good management were used. In the rest of the area, the response would be low because the soils are cherty or gravelly and cannot supply enough moisture.

About 75 percent of the association is in cutover forest. Most of the acreage that is cleared is on the caps and upper parts of hills; the acreage that is cleared on each farm is small. The farms in the area are mainly subsistence farms. Cotton, corn, and annual lespedeza are the main crops, but pimento peppers are grown on a small acreage.

The areas that are suitable for cultivated crops are small and are mainly on the upper parts of hills and along drainageways. Much of the acreage in this association would make fair to good pastures. Therefore, the area is probably best suited to the raising of livestock and growing of small acreages of corn and cotton as a source of supplementary income. On the steep slopes the soils contain much chert and gravel. In these areas the soils are not productive enough for either crops or pasture and would be best used for trees.

6. Wolftever-Beason-Egam Association

Nearly level soils on low stream terraces and flood plains of the Tennessee River

This soil association consists of nearly level soils on low terraces and flood plains of the Tennessee River. The areas lie along either side of the Tennessee River from Pickwick Landing Dam to the northern border of the county. The soils are dominantly moderately well drained to somewhat poorly drained. Less than 10 percent of the acreage is well drained. All of the areas are subject to occasional flooding. This association makes up 10.9 percent of the county. Figure 3 shows the major soil series in this association and their relationship to the landscape.

About 70 percent of the association consists of Wolftever and Beason soils. The acreage of the Wolftever soils is larger than that of the Beason. The Wolftever soils are on broad ridges that are only slightly higher than the flood plains. They are moderately well drained. The Beason soils, which are somewhat poorly drained, are on large, flat areas alongside the Wolftever.

The Egam soils lie between the Huntington soils, which are adjacent to the Tennessee River, and the Wolftever and Beason soils, which are on low terraces. Egam soils are moderately well drained and have a subsoil that is compacted.

The natural fertility ranges from low in the poorly drained soils of the terraces to high in the well-drained soils of the flood plains. The soils are mainly strongly acid or medium acid, but a small acreage is nearly neutral.

Nearly all of this association is used for corn, grain sorghum, cotton, and hay crops. There are a few patches of trees on the poorly drained soils. Because of flooding there are no farmers living in this area. The area is farmed mainly by absentee owners and sharecroppers. Only a few areas are fenced for livestock. Much of the acreage has been cropped intensively and now needs fertilizer and lime.

This association has a high potential for grain crops and perhaps some hay crops. It is not suitable for livestock, because of the flooding and the short grazing season. Crops that are suited make fair to good yields in most areas. The crops selected must be suitable for the kind of drainage of the particular soil. Much of this area can be cultivated intensively, and erosion is not an important problem. For most of the soils, the response to fertilizer is good enough to justify adding large amounts.

7. Pickwick-Talbott-Waynesboro Association

Well-drained soils of broad, irregular, mainly rolling, low hills and terraces

This soil association consists mainly of well-drained soils of the low hills and terraces. It is in the northeastern part of the county. The areas are mainly rolling but range to undulating and moderately steep. The hills are low and are broad and irregular. Some areas adjacent to the deep drainageways have short, steep slopes. A few of the steep areas have outcrops of limestone bedrock. This association makes up only 3 percent of the county.

The Pickwick, Talbott, and Waynesboro are the main soils in this association. The Pickwick soils are mostly on the upper parts of slopes. Talbott soils are mostly on the lower parts of slopes, but small areas of these soils occur in all parts of the association. The Waynesboro soils are scattered throughout the association on a wide range of slopes.

The Pickwick and Waynesboro soils have developed in old alluvium. These soils are similar, but the Pickwick soils are browner and are more productive than the Waynesboro, which in some places are gravelly. The Talbott soils developed in material weathered from limestone and have a plastic, clayey subsoil.

On a few of the broad flats of the uplands are the Paden soils, which are moderately well drained. The soils on the bottom lands are in narrow strips along small streams and drainageways. The areas are small, but because the soils are highly productive, they are important in the association.

The soils of the uplands are strongly acid and are low in natural fertility, but those of the bottom lands are less acid and are moderate in fertility. Many areas in this association have been cleared longer than other areas of the county and have been used continuously for crops. As a result, the areas are severely eroded and are cut by shallow and deep gullies.

About 60 percent of this association is in cutover forest. The areas that are severely eroded are large and are sparsely vegetated. Cotton, corn, and lespedeza are grown in the better areas of the Pickwick, Paden, and Waynesboro soils. The soils of the narrow bottom lands are used intensively for cotton, corn, and vegetables. There are few cattle in the area and few improved pastures.

The acreage of soils in this association that are suitable for row crops is small. Most of the productive soils are in small areas on the caps of low hills, on foot slopes, or on the narrow bottom lands. Because tilth is poor and the supply of moisture is low, the areas that are severely eroded give only moderate to low response to management. A wide variety of crops could be grown on the areas that are not severely eroded if cropping systems are used that will maintain the productivity of the soils. Some of the severely eroded soils would make good pastures, but large amounts of fertilizer would be needed.

8. Bodine-Talbott-Culleoka Association

Shallow soils on steep uplands

This soil association consists of shallow soils on steep uplands. It is in the northeastern part of the county along the valley of Smith Fork and the valleys of Indian and Hardin Creeks, which are underlain by limestone. The dominant soils are the Bodine, Talbott, Culleoka, and those of the Dandridge-Needmore complex. The soils range from silt loam over cherty limestone to fine sandy loam over terrace or coastal plain materials. Slopes range from 5 to 45 percent. This association makes up 5.8 percent of the county. Figure 4 shows the major soil series in the association and their relationship to the landscape.

The Bodine soils make up about 35 percent of the association. These sloping to steep soils overlie cherty limestone. They have a surface layer of cherty silt loam and are underlain by beds of chert at a depth between 18 and 24 inches.

About 25 percent of the association consists of soils of the Dandridge-Needmore complex. The soils in this com-

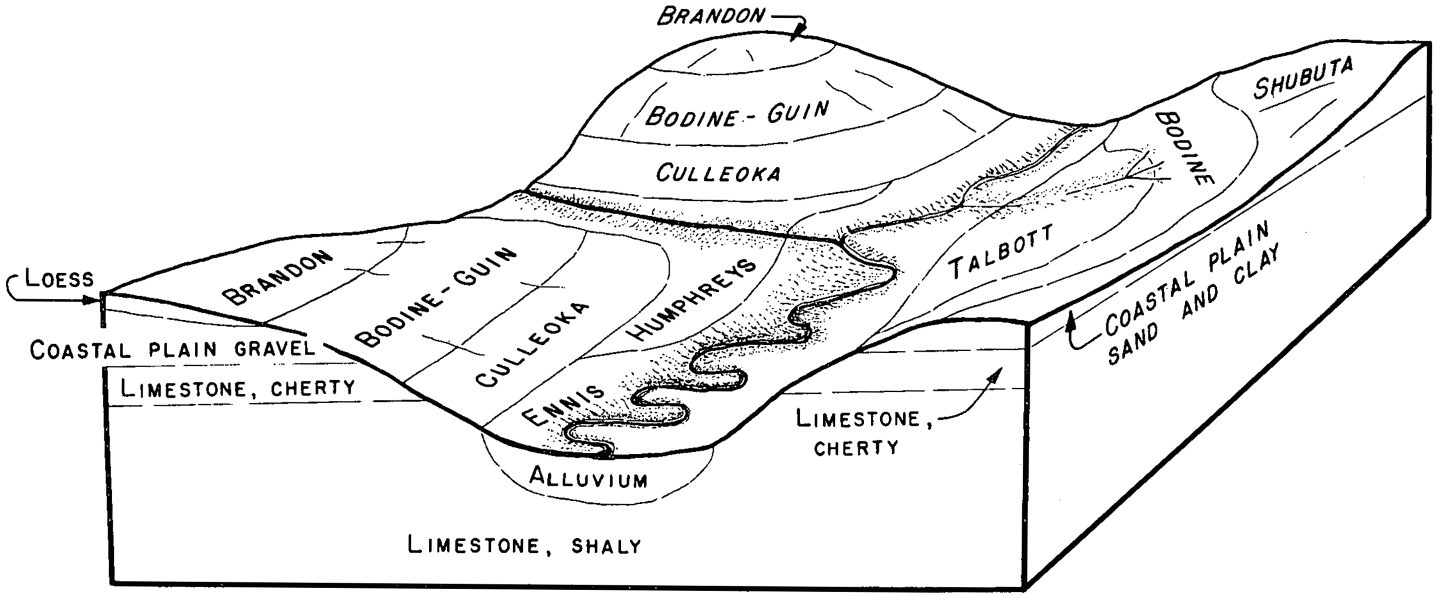

Figure 4.—**Major soil series in soil associations 8 and 10 and their relationship to the landscape.**

plex are sloping to steep. The Dandridge soils are shallow and are shaly. They are on the upper part of slopes. The Needmore soils are on less steep areas, including the lower part of toe slopes where there are thin smears of colluvial material. The Needmore soils have profiles that are well developed. In some places they have cherty colluvial material on the surface.

The Talbott soils make up about 20 percent of this association. These soils are near the base of slopes. They have a surface layer of silt loam and a subsoil of plastic clay. In some places outcrops of chert and limestone are common.

About 15 percent of the association is made up of Culleoka soils. These soils developed in material weathered from Hardin sandstone. They occupy lower positions than the Bodine soils or the soils of the Dandridge-Needmore complex. The Culleoka soils are in small areas on ridgetops, but on steep side slopes the areas are larger. They have a surface layer of silt loam that is very friable. The subsoil is silty clay loam that is friable. Commonly, there are outcrops of rock and fragments of sandstone on the surface.

The remainder of this association consists of Rock land and of Ennis, Lobelville, and Lee soils. Rock land occupies many acres along the steep-walled valleys. In the narrow drainageways are the Ennis, Lobelville, and Lee soils. The Ennis soils are well drained, the Lobelville are moderately well drained, and the Lee are poorly drained.

Only a few areas in this association are used for row crops, chiefly cotton, corn, and annual lespedeza. Yields are fair. The acreage of soils that are cultivated is small on the individual farms. On a few farms there are small herds of beef cattle. Many of the farms in this association are operated on a part-time basis.

The forests in this association are largely on soils that have slopes of 12 to 45 percent. The trees consist of cutover hardwoods and redcedars. The principal hardwoods are oaks and hickories. Trees grow slowly on the shallow, south-facing soils. Yellow-poplar, maple, beech, walnut, and oaks grow better on the lower slopes and in the hollows. All areas in trees are protected from fires, and only a small part is grazed.

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9. Talbott-Pickwick Association

Fine-textured soils over limestone on rolling to hilly uplands

This soil association is made up of fine-textured soils over limestone. These soils are on rolling to hilly uplands in the northeastern part of the county. The area consists mainly of narrow, irregular ridgetops and long, moderately steep side slopes. Most areas have slopes between 5 and 25 percent. The steepest slopes are short and lie near the narrow drainageways that dissect the area. This association makes up only 1 percent of the county.

The Talbott soils comprise about 70 percent of the area. These soils are on the points of ridges and on steep side slopes. They formed in material weathered from massive limestone, are clayey, and contain varying amounts of chert. In places there are outcrops of bedrock.

About 20 percent of the area consists of Pickwick soils. These soils are commonly on the ridgetops or upper parts of slopes. They are deep, well-drained soils that are productive.

In places areas of Pickwick soils are flanked by steep, gravelly or very gravelly Waynesboro soils. On a few of the broad ridgetops are soils of the Paden series, which have a fragipan. In the narrow drainageways are soils of the Ennis series. These soils formed in local alluvium and are deep and well drained.

Most areas used for agriculture in this association have been cleared for a long time and are severely eroded. Little corn is grown, but cotton is grown on some of the less sloping areas of the Pickwick and Paden soils. The livestock is mostly beef cattle and hogs. Pastures are mostly unimproved. Several areas are idle and are reverting to trees.

The small acreage of soils on benches and bottoms is well suited to the crops commonly grown in the county. Because of steep slopes or chertiness, many small areas in the association are not suited to crops that are tilled but can be used for such plants as tall fescue, whiteclover, orchardgrass, alfalfa, and lespedeza. Yields are fair. The smoother, deeper, and more fertile soils on the ridges are poorly suited to row crops, but if moisture is adequate, good yields of forage can be made. The steep, shallow, and rocky parts of the ridges are better suited to trees than to pasture or to row crops.

The trees in the woodlands are principally mixed hardwoods and cedars, but they include some pines. On the more favorable moist sites there is some white oak, yellow-poplar, and walnut. On the steep, shallow, and droughty soils there are more cedars than other kinds of trees.

Most farms in this association consist of soils that are suitable for hay and pasture but are not so well suited to grain crops because of the hazard of erosion. The area, therefore, is well suited to the raising of livestock.

10. Ennis-Lobelville-Humphreys Association

Nearly level, silty, cherty soils on flood plains and low terraces along small streams

This soil association consists of nearly level soils that are silty and cherty. These soils occupy broad areas on flood plains and low terraces along Smith Fork and along Horse, Indian, and Hardin Creeks. All of the streams flow from uplands in the eastern part of the county that are underlain by cherty limestone. Consequently, the soils in a few areas of the flood plains are fairly cherty. The texture of most of the soils is silt loam or loam, but in a few areas it is sandy loam or loamy sand. About three-fourths of the area is well drained; the rest is moderately well drained to poorly drained. This association makes up 8 percent of the county. Figure 4 shows the major soil series in the association and their relation to the landscape.

About 60 percent of the association consists of Ennis soils. These soils are deep, are well drained, and are productive.

The Lobelville soils are on first bottoms adjacent to the Ennis soils. These soils are moderately well drained to somewhat poorly drained. Also on first bottoms are the Lee soils. These inextensive soils are poorly drained and are gray.

Small areas of Humphreys soils are on low terraces that lie only a few feet above the first bottoms. These soils are deep, well drained, and productive.

All of the soils are moderate in natural fertility. They are medium acid to strongly acid. Most of the soils have high moisture-supplying capacity and respond well if fertilizer is applied. Practically all areas are subject to annual flooding.

Only about 2 percent of this association is in trees. The trees are along streams in small, odd-shaped tracts. Sycamore, maple, beech, ash, sweetgum, and other trees that grow on bottom lands are on many areas that are dissected by old channels of streams. Most of this soil association is used for corn, cotton, and annual lespedeza. A few areas are in pastures, which yield large amounts of forage. Several areas are idle, mainly because of scouring by floodwaters or deposition of chert.

Farming in this area is more diversified than in other areas of the county. Also, more swine and beef cattle are raised on the farms. Much of the corn grown on the farms is fed to the livestock, but some is sold for cash.

Most of the soils in this association are productive. The areas on bottom lands can be cropped intensively. If moderate amounts of fertilizer are applied and other good management is used, yields of row crops and hay crops in such areas are high. Pastures on the more cherty or poorly drained areas on the bottoms also make good yields.

This association is well suited to the raising of cattle and hogs. Grain and silage crops can be grown on the bottoms, and the animals can be pastured on the terraces and adjoining uplands.

Descriptions of the Soils

This section provides detailed information about the soils. It describes in alphabetic order each series in the county.

Following the general description of each series, a description of a soil profile of one of the mapping units in that series is given. If only one profile is given for a series, you may assume that all the other soils in the series have essentially the same kind of profile. The differences, if any, would probably be in the texture or thickness of the surface soil. If the profiles of the soil types within a series differ significantly, more than one profile is described. The descriptions of color and consistence are those of moist soil; the symbols used for color are expressed by Munsell notations (*11*).[1] Terms used to describe the soils are defined in the Glossary.

The characteristics emphasized for a single soil are those that directly affect its management. For example, there are four Pickwick soils that have a silty clay loam surface layer and that are similar in profile and in degree of erosion. These soils, however, differ in slope, a characteristic that affects their management.

A list of the soils mapped is given at the back of the report, along with the capability unit and woodland group of each. The approximate acreage and proportionate extent of the soils are given in table 1. Their location and distribution are shown on the soil map at the back of this report.

Almo Series

The Almo series is made up of nearly level, poorly drained soils that have a fragipan (dense, brittle layer) at a depth between 15 and 20 inches. The soils are on old stream terraces where they developed in sediments made up of loess and coastal plains material. The areas are small.

The surface layer of these soils is friable, grayish-brown silt loam that is 6 to 10 inches thick. The upper subsoil, a highly mottled silty clay loam, is between 15 and 20 inches thick. It is underlain by the fragipan that extends to a depth between 28 and 45 inches. Below a depth of 45 inches are stratified layers that range from silt loam

[1] Italic numbers in parentheses refer to Literature Cited, p. 129.

TABLE 1.—*Acreage and proportionate extent of soils mapped*

Soil	Acres	Percent
Almo silt loam	1, 176	0. 3
Beason silt loam	5, 993	1. 6
Bodine cherty silt loam, 12 to 35 percent slopes	21, 063	5. 6
Bodine cherty silt loam, 5 to 12 percent slopes	2, 854	. 8
Bodine-Guin complex, 20 to 35 percent slopes	6, 012	1. 6
Boswell fine sandy loam, 2 to 8 percent slopes	413	. 1
Boswell fine sandy loam, 8 to 12 percent slopes	322	. 1
Boswell silty clay, 2 to 8 percent slopes, severely eroded	392	. 1
Boswell silty clay, 8 to 12 percent slopes, severely eroded	586	. 2
Boswell soils, 12 to 25 percent slopes, eroded	241	. 1
Brandon silt loam, 5 to 8 percent slopes	1, 052	. 3
Brandon silt loam, 8 to 12 percent slopes	247	. 1
Bruno loamy fine sand	562	. 1
Captina silt loam, 2 to 5 percent slopes, eroded	1, 699	. 5
Captina silt loam, 0 to 2 percent slopes	805	. 2
Captina silty clay loam, 2 to 8 percent slopes, severely eroded	881	. 2
Colbert silty clay loam, 5 to 12 percent slopes	663	. 2
Colbert silty clay loam, 12 to 25 percent slopes	1, 075	. 3
Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes	680	. 2
Colbert-Talbott very rocky clays, 8 to 25 percent slopes	250	. 1
Collins fine sandy loam	1, 467	. 4
Collins loam, local alluvium	4, 936	1. 3
Collins silt loam	1, 453	. 4
Culleoka silt loam, 5 to 12 percent slopes	365	. 1
Culleoka silt loam, 12 to 35 percent slopes	1, 111	. 3
Cuthbert fine sandy loam, 12 to 25 percent slopes	396	. 1
Cuthbert fine sandy loam, 25 to 35 percent slopes	300	. 1
Cuthbert-Ruston complex, 12 to 35 percent slopes	1, 011	. 3
Cuthbert and Susquehanna soils, 5 to 12 percent slopes	485	. 1
Dandridge-Needmore complex, 12 to 35 percent slopes	7, 508	2. 0
Dandridge-Needmore complex, 8 to 12 percent slopes	523	. 1
Dexter loam, 2 to 5 percent slopes, eroded	318	. 1
Dexter loam, 5 to 8 percent slopes, eroded	438	. 1
Dexter loam, 8 to 12 percent slopes	386	. 1
Dexter clay loam, 2 to 5 percent slopes, severely eroded	205	. 1
Dexter clay loam, 5 to 8 percent slopes, severely eroded	779	. 2
Dexter clay loam, 8 to 12 percent slopes, severely eroded	896	. 2
Dulac silt loam, 2 to 5 percent slopes	1, 679	. 4
Dulac silt loam, 2 to 5 percent slopes, eroded	684	. 2
Dulac silt loam, 2 to 5 percent slopes, severely eroded	399	. 1
Dulac silt loam, 5 to 8 percent slopes	609	. 2
Dulac silt loam, 5 to 8 percent slopes, severely eroded	656	. 2
Dunning silty clay loam	196	. 1
Egam silty clay loam	4, 282	1. 1
Ennis silt loam	7, 412	2. 0
Ennis silt loam, local alluvium	1, 058	. 3
Ennis cherty silt loam	2, 494	. 7
Ennis cherty silt loam, local alluvium	3, 090	. 8
Ennis fine sandy loam	2, 527	. 7
Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded	921	. 2
Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded	793	. 2
Falaya silt loam	3, 492	. 9
Falaya loam, local alluvium	4, 164	1. 1
Freeland loam, 2 to 5 percent slopes, eroded	1, 917	. 5
Freeland loam, 2 to 5 percent slopes, severely eroded	765	. 2
Freeland loam, 5 to 8 percent slopes, eroded	358	0. 1
Freeland loam, 5 to 8 percent slopes, severely eroded	979	. 3
Gravelly alluvial land	803	. 2
Gullied land, clayey materials	2, 783	. 7
Gullied land, loamy materials	3, 501	. 9
Gullied land, sandy materials	857	. 2
Hatchie loam	1, 381	. 4
Humphreys silt loam, 2 to 5 percent slopes, eroded	1, 382	. 4
Humphreys cherty silt loam, 2 to 5 percent slopes, eroded	544	. 1
Huntington silt loam	1, 319	. 3
Huntington fine sandy loam	1, 932	. 5
Landisburg cherty silt loam, 5 to 12 percent slopes, eroded	1, 050	. 3
Landisburg cherty silt loam, 12 to 20 percent slopes	487	. 1
Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded	355	. 1
Lee silt loam	1, 613	. 4
Lee cherty silt loam	886	. 2
Lindside silt loam	3, 009	. 8
Lindside silty clay loam	1, 283	. 3
Lobelville silt loam	4, 070	1. 1
Lobelville cherty silt loam	858	. 2
Magnolia fine sandy loam, 5 to 8 percent slopes	1, 315	. 3
Magnolia fine sandy loam, 8 to 12 percent slopes	622	. 2
Magnolia fine sandy loam, 12 to 25 percent slopes	878	. 2
Mantachie fine sandy loam	2, 874	. 8
Melvin and Newark silt loams	4, 818	1. 3
Minvale cherty silt loam, 5 to 12 percent slopes	1, 180	. 3
Minvale cherty silt loam, 12 to 25 percent slopes	564	. 1
Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded	566	. 1
Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded	156	(1)
Mountview silt loam, 5 to 8 percent slopes	2, 213	. 6
Paden silt loam, 2 to 5 percent slopes	5, 299	1. 4
Paden silt loam, 2 to 5 percent slopes, eroded	9, 266	2. 5
Paden silt loam, 2 to 5 percent slopes, severely eroded	6, 573	1. 7
Paden silt loam, 5 to 8 percent slopes	1, 090	. 3
Paden silt loam, 5 to 8 percent slopes, eroded	659	. 2
Paden silt loam, 5 to 8 percent slopes, severely eroded	2, 785	. 7
Paden-gullied land complex	377	. 1
Pickwick silt loam, 2 to 5 percent slopes	3, 551	. 9
Pickwick silt loam, 2 to 5 percent slopes, eroded	2, 887	. 8
Pickwick silt loam, 5 to 8 percent slopes	5, 441	1. 4
Pickwick silt loam, 5 to 8 percent slopes, eroded	1, 566	. 4
Pickwick silt loam, 8 to 12 percent slopes	1, 631	. 4
Pickwick silt loam, 12 to 25 percent slopes	1, 252	. 3
Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded	4, 630	1. 2
Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded	6, 122	1. 6
Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded	2, 055	. 5
Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded	620	. 2
Pickwick-gullied land complex	1, 117	. 3
Robertsville silt loam	3, 076	. 8
Rock land	2, 632	. 7
Ruston fine sandy loam, 5 to 8 percent slopes	1, 328	. 4
Ruston fine sandy loam, 8 to 12 percent slopes	463	. 1
Ruston fine sandy loam, 12 to 25 percent slopes	1, 725	. 5
Ruston fine sandy loam, 25 to 45 percent slopes	4, 374	1. 2
Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded	596	. 2

See footnote at end of table.

TABLE 1.—*Acreage and proportionate extent of soils mapped*—Continued

Soil	Acres	Percent	Soil	Acres	Percent
Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded	382	0.1	Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded	294	0.1
Saffell gravelly sandy loam, 5 to 12 percent slopes	685	.2	Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded	383	.1
Saffell gravelly sandy loam, 12 to 20 percent slopes	410	.1	Vicksburg loam	512	.1
Sequatchie fine sandy loam, 0 to 2 percent slopes	281	.1	Vicksburg loam, local alluvium	3,538	.9
Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded	681	.2	Waverly fine sandy loam	4,270	1.1
Sequatchie loam, 2 to 8 percent slopes, severely eroded	326	.1	Waverly silt loam	13,259	3.5
Shubuta fine sandy loam, 5 to 8 percent slopes	10,730	2.9	Waynesboro fine sandy loam, 2 to 5 percent slopes	1,064	.3
Shubuta fine sandy loam, 5 to 8 percent slopes, eroded	608	.2	Waynesboro fine sandy loam, 5 to 8 percent slopes	9,177	2.4
Shubuta fine sandy loam, 8 to 12 percent slopes	4,421	1.2	Waynesboro fine sandy loam, 8 to 12 percent slopes	2,781	.7
Shubuta fine sandy loam, 12 to 25 percent slopes	12,253	3.3	Waynesboro fine sandy loam, 12 to 35 percent slopes	3,633	1.0
Shubuta fine sandy loam, 25 to 45 percent slopes	6,538	1.7	Waynesboro clay loam, 2 to 5 percent slopes, severely eroded	634	.2
Shubuta clay loam, 5 to 8 percent slopes, severely eroded	1,127	.3	Waynesboro clay loam, 5 to 8 percent slopes, severely eroded	1,553	.4
Shubuta clay loam, 8 to 12 percent slopes, severely eroded	1,032	.3	Waynesboro clay loam, 8 to 12 percent slopes, severely eroded	790	.2
Shubuta clay loam, 12 to 25 percent slopes, severely eroded	1,040	.3	Waynesboro clay loam, 12 to 35 percent slopes, severely eroded	447	.1
Shubuta-gullied land complex	611	.2	Waynesboro gravelly sandy loam, 5 to 8 percent slopes	5,962	1.6
Silerton silt loam, 2 to 5 percent slopes	5,934	1.6	Waynesboro gravelly sandy loam, 8 to 12 percent slopes	2,528	.7
Silerton silt loam, 2 to 5 percent slopes, eroded	1,000	.3	Waynesboro gravelly sandy loam, 12 to 25 percent slopes	6,958	1.9
Silerton silt loam, 5 to 8 percent slopes	5,402	1.4	Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded	2,663	.7
Silerton silt loam, 5 to 8 percent slopes, eroded	645	.2	Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded	1,811	.5
Silerton silt loam, 8 to 12 percent slopes	1,918	.5	Waynesboro very gravelly sandy loam, 12 to 25 percent slopes	2,140	.6
Silerton silty clay loam, 2 to 5 percent slopes, severely eroded	527	.1	Waynesboro very gravelly sandy loam, 5 to 12 percent slopes	1,697	.5
Silerton silty clay loam, 5 to 8 percent slopes, severely eroded	754	.2	Waynesboro very gravelly sandy loam, 25 to 45 percent slopes	11,346	3.0
Silerton silty clay loam, 8 to 12 percent slopes, severely eroded	360	.1	Wolftever silt loam, 2 to 5 percent slopes	621	.2
Sumter silty clay, 5 to 12 percent slopes, eroded	58	(1)	Wolftever silt loam, 0 to 2 percent slopes	4,412	1.2
Sumter silty clay, 12 to 35 percent slopes, eroded	101	(1)	Wolftever silt loam, 2 to 5 percent slopes, eroded	3,165	.8
Swamp	448	.1	Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded	637	.2
Taft silt loam	1,674	.4	Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded	386	.1
Talbott silt loam, 2 to 5 percent slopes	226	.1	Mine pits and dumps	225	.1
Talbott silt loam, 5 to 8 percent slopes	679	.2	Total land area	375,680	100.0
Talbott silt loam, 8 to 12 percent slopes	661	.2	Water	10,880	
Talbott silt loam, 12 to 25 percent slopes	1,066	.3	Total area of county	386,560	
Talbott silty clay, 5 to 8 percent slopes, severely eroded	270	.1			
Talbott silty clay, 8 to 25 percent slopes, eroded	461	.1			
Talbott cherty silt loam, 5 to 12 percent slopes	1,079	.3			
Talbott cherty silt loam, 12 to 25 percent slopes	1,419	.4			
Talbott cherty silt loam, 25 to 35 percent slopes	555	.1			

[1] Less than 0.1 percent.

to clay in texture. In areas that have not been drained, the subsoil is waterlogged and, consequently, it is poorly aerated for much of the year.

The Almo soils lie between the Hatchie soils, which are on slightly higher terraces, and the Collins, Falaya, and Waverly soils on bottom lands. Almo soils are older than the Waverly soils, which are also poorly drained, and are less likely to be flooded. They are similar to the Robertsville soils, which occupy flood plains of the Tennessee River.

Only one soil of the series—Almo silt loam—is mapped in this county.

Almo silt loam (0 to 2 percent slopes) (Am).—This poorly drained, terrace soil has a fragipan at a depth of about 15 inches. The following describes a profile in a cultivated area:

A_p 0 to 6 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; friable.

A_2 6 to 10 inches, grayish-brown (2.5Y 5/2) or light brownish-gray (2.5Y 6/2) silt loam; a few, fine mottles of yellowish brown (10YR 5/6) or olive brown (2.5Y 4/4); weak, fine, granular structure; friable.

B_{2g} 10 to 15 inches, light brownish-gray (2.5Y 6/2) or light-gray (2.5Y 7/2) silty clay loam; many, fine, distinct mottles of yellowish brown and strong brown; weak, fine, subangular blocky structure; friable.

B_{3mg} 15 to 45 inches, light-gray (2.5Y 7/2 to 6/0 or 10YR 7/1 to 6/1) silty clay loam that grades to silty clay in the lower part; many, fine, distinct mottles of yellowish brown, strong brown, and olive brown; massive and compact in place, but breaks to fine and medium, angular blocky structure; friable to firm.

C_g 45 to 55 inches +, mottled light-gray, light olive-brown, yellowish-brown, and strong-brown silty clay loam that grades to stratified silt loam and fine sandy loam.

The texture of the subsoil ranges from silt loam or fine sandy loam to clay loam, and that of the stratified materials of the substratum, from fine sandy loam to clay.

In a very small acreage the profile is darker colored throughout than that of the soil described. Here, the surface layer is very dark grayish brown or nearly black, and the subsoil is predominantly dark gray. In a few places there is a thin layer of overwash that is slightly browner than the normal surface soil. Throughout the soil there are a few to many small concretions. In some areas pebbles occur in the lower part of the profile.

This soil is strongly acid and low in natural fertility. Poor natural drainage limits the use of this soil. Surface runoff is slow, and the subsoil is waterlogged and poorly aerated during much of winter and spring. Most areas are flooded occasionally for short periods, mainly in winter and spring. Because the root zone for most plants is confined to the upper 10 to 15 inches, the soil is likely to be droughty in the drier months of summer.

If this soil is drained adequately, corn, cotton, soybeans, and grain sorghum grow well. Soybeans and grain sorghum will grow fairly well, even though the soil is not drained. If adequate amounts of fertilizer are added and the soil is otherwise well managed, yields are fair to good. Because of wetness in spring, planting is often delayed. Crops are likely to be damaged by too much water in years when rainfall is heavier than normal.

Pastures of good quality can be produced on this soil if the areas are well fertilized. The soil is suited to grasses and legumes that tolerate wetness, such as tall fescue and whiteclover. Because this soil is waterlogged during much of the winter and spring, the time that pastures can be grazed is short. The areas are well suited to supplemental grazing in summer, and sudangrass and millet are suitable plants. (Capability unit IVw–1; woodland group 7.)

Beason Series

The Beason series consists of somewhat poorly drained soils on low stream terraces. The soils developed in old alluvium, which is made up chiefly of material from limestone but includes some material from sandstone, shale, and loess.

The surface layer is dark grayish-brown silt loam. The subsoil is mottled silty clay loam to silty clay that contains a compact, highly mottled layer at a depth of about 24 inches.

These soils are near the moderately well drained Wolftever and Captina soils, which are also on low stream terraces. In a few places the Beason soils are adjacent to the well-drained Sequatchie soils, and in many places they border the poorly drained Robertsville soils. Beason soils are also near the Lindside soils and the Melvin and Newark silt loams, which are on flood plains, but they are older than those soils.

The Beason soils are more poorly drained and have a grayer subsoil than the Captina soils. They are somewhat similar to the Hatchie soils, but they are browner and finer textured. They are not so well drained as the Wolftever soils.

Only one soil of this series—Beason silt loam—is mapped in Hardin County.

Beason silt loam, (0 to 2 percent slopes) (Ba).—This somewhat poorly drained soil is mostly on low terraces of the Tennessee River, where it is subject to flooding. The following describes a representative profile:

A_p 0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, crumb structure; very friable; common fine roots; a few small concretions.

B_1 7 to 18 inches, brown (10YR 5/3) silty clay loam; a few, fine mottles of yellowish brown (10YR 5/4) and grayish brown (10YR 5/2); weak, fine, subangular blocky structure; firm to friable; a few, fine, black and brown concretions.

B_{21} 18 to 28 inches, mottled brown (10YR 5/3), yellowish-brown (10YR 5/4), grayish-brown (10YR 5/2), and strong-brown (7.5YR 5/6) silty clay; weak, fine, subangular and angular blocky structure; firm; many pores; a few, small, black or brown concretions.

B_{22} 28 to 46 inches, mottled brown (10YR 5/3), yellowish-brown (10YR 5/4 to 5/6), and grayish-brown (10YR 5/2) silty clay; weak, fine, subangular and angular blocky structure to massive; firm; many, small, brown and black concretions.

B_{23} 46 to 63 inches, mottled grayish-brown (10YR 5/2), light brownish-gray (10YR 6/2), and light yellowish-brown (10YR 6/4) silty clay; weak, medium, subangular blocky structure to massive; many, small, dark-brown, soft and hard concretions.

C 63 to 86 inches +, dark-brown (7.5YR 4/4) to dark yellowish-brown (10YR 4/4) silty clay loam; common mottles of light brownish gray (10YR 6/2), grayish brown (10YR 5/2), brown (10YR 5/3), and strong brown (7.5YR 5/6); weak, coarse, angular blocky structure to massive; friable; fine mica flakes are common.

This soil is medium acid to strongly acid, and it is moderately low in natural fertility. Runoff is slow to moderately slow. The water table is at or near the surface during the winter and early in spring. As a result, the subsoil is likely to be poorly aerated. Development of roots is, therefore, restricted to about the uppermost foot of the soil.

Practically all of this soil has been used for crops and pasture, but much of the acreage is now idle. The chief crops presently grown are corn and soybeans and annual lespedeza for hay; tall fescue and whiteclover are grown in improved pastures. Yields are low.

If adequate surface drainage is provided, yields of crops will be improved. Corn, grain sorghum, and soybeans are suitable row crops to plant if adequate amounts of fertilizer are applied and the soil is otherwise well managed. Tall fescue, whiteclover, and sudangrass will yield profitable amounts of forage. (Capability unit IIw–1; woodland group 7.)

Bodine Series

The Bodine series consists of well-drained to excessively drained soils. The soils developed in material weathered from cherty limestone on steep slopes and narrow ridgetops. They occupy small to large areas in many parts of the county, but they are mainly in the highly dissected, hilly sections in the eastern part. Slopes range from 5 to 35 percent.

The surface layer of these soils, a light yellowish-brown cherty silt loam, is 6 to 10 inches thick. The subsoil, a yellowish-brown very cherty silt loam or cherty silty

clay loam, is 15 to 24 inches thick. It rests on beds of chert. A profile of a Bodine cherty silt loam is shown in figure 5.

Figure 5.—**Profile of a Bodine cherty silt loam.**

The Bodine soils are near the Mountview, Talbott, Landisburg, Minvale, Waynesboro, and Shubuta soils and the Dandridge-Needmore soils. They are coarser textured than the Talbott soils, which have a reddish rather than a yellowish subsoil. They are not so coarse textured as the Guin soils with which they are associated in places.

Bodine soils have strong slopes, are cherty, and are low in fertility. They are also very low in moisture-supplying capacity and are strongly acid. Consequently, they are of limited use for agriculture. They are better suited to trees or pasture than to cultivated crops. Most of the acreage is in forest made up chiefly of various kinds of hardwoods. The trees are of poor quality.

Bodine cherty silt loam, 12 to 35 percent slopes (BdF).—This soil is on steep slopes of ridges. The following describes a profile in a mixed hardwood forest:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) cherty silt loam; weak, fine, granular structure; very friable.

A_2 1 to 9 inches, light yellowish-brown (10YR 6/4) cherty silt loam; fine and medium, granular structure; very friable.

BC 9 to 16 inches, yellowish-brown (10YR 5/4 to 5/6) very cherty silt loam or cherty silty clay loam; few to common, pale-brown (10YR 6/3), light brownish-gray (10YR 6/2), and yellowish-red (5YR 4/6) variegations; weak, fine, subangular blocky structure; friable.

C_1 16 to 24 inches, variegated yellowish-brown (10YR 5/4), pale-brown (10YR 6/3), yellowish-red (5YR 4/6), and red (2.5YR 4/6) very cherty silty clay loam; weak to moderate, fine, subangular blocky structure.

C_2 24 to 50 inches +, beds of chert; between the pieces of chert is variegated yellowish-red, light brownish-gray, and pale-brown silty clay loam.

The profile above the beds of chert ranges from 1 to 3 feet in depth. In areas where the profile is deepest there is a weakly developed B_2 horizon in some places. Coarse to fine chert makes up 50 percent of the A and BC horizons, and in the deeper part of the profile, it makes up 90 percent or more of the material. In places there is a thin layer of loess on the surface. The beds of chert are as much as 125 feet thick in places.

Bodine cherty silt loam, 12 to 35 percent slopes, is strongly to very strongly acid. It is low in organic matter and plant nutrients and is very low in moisture-supplying capacity. The chert in the soil interferes with the use of most farm machinery.

Most of the acreage is in forests made up chiefly of mixed hardwoods. The forests are generally poor and contain many small and cull trees. A small acreage has been cleared and is used for crops or has been improved for pasture. Most of the cleared areas, however, are idle or are used as unimproved pasture.

This soil is poorly suited to tilled crops and to pasture. Its best use would be for trees. (Capability unit VIIs–1; woodland group 9.)

Bodine cherty silt loam, 5 to 12 percent slopes (BdD).—This soil is mainly on narrow ridgetops. Except for the gentler slope, it is similar to Bodine cherty silt loam, 12 to 35 percent slopes.

Most of this soil remains in forest. A small acreage has been cleared and has been moderately to severely eroded; these areas are mostly idle or are used as unimproved pasture.

The use of this soil for agriculture is limited by cherti-ness, low fertility, and the low supply of moisture. The areas are generally small and are farmed the same as adjacent larger areas of steep, cherty soils that are poorly suited to either crops or pasture.

This soil is probably best used for pasture or trees, but small grains, strawberries, and other crops that mature early can be grown. Sericea lespedeza, bermudagrass, and other plants that resist drought are suitable pasture plants. Yields are fair if the soil is well managed. (Capability unit IVs–1; woodland group 9.)

Bodine-Guin complex, 20 to 35 percent slopes (BeF).—This complex is made up of Bodine and Guin soils that are so intermixed that they were not mapped separately. About 60 percent of the complex is Bodine soils, and about 40 percent is Guin. The areas are chiefly in the southeastern part of the county.

The surface layer of these soils is friable, dark-brown or dark grayish-grown gravelly sandy loam or cherty silt loam. A profile of a Bodine soil is given under Bodine cherty silt loam, 12 to 35 percent slopes. The following describes a profile of a Guin soil of this complex in a forested area:

A_1 0 to 2 inches, dark-gray (10YR 4/1) gravelly sandy loam; weak, fine, granular structure; very friable; strongly acid.

A_2 2 to 9 inches, pale-brown or light yellowish-brown (10YR 6/3 to 6/4) gravelly sandy loam; weak, fine, granular structure; very friable.

C_1 9 to 36 inches +, beds of Tuscaloosa gravel that consist of rounded chert mixed with yellowish-brown to red, sandy material.

The Bodine soils formed in the weathered products of Fort Payne chert. The Guin soils developed in material from beds of Tuscaloosa gravel that are 5 to 100 feet thick. The gravel makes up 50 to 90 percent of the soil, by volume, at a depth below 8 to 10 inches. Generally, the Guin

soils occupy the higher part of the slope, and the Bodine the lower, but in places either soil occupies any segment of the slope.

The Bodine and Guin soils are very strongly acid. They are droughty and are low in fertility. Internal drainage and the rate of infiltration are rapid. The moisture-supplying capacity is very low.

Bodine-Guin complex, 20 to 35 percent slopes, is poorly suited to crops and pasture. The soils are best suited to trees, and most of the acreage is in forests of cutover pine and mixed hardwoods. (Capability unit VIIs–1; woodland group 9.)

Boswell Series

The Boswell series consists of well-drained soils developed in coastal plain clay and sandy clay. The soils are rolling to moderately steep. In most places slopes range from 2 to 12 percent. These soils are in the northwestern part of the county. Their acreage is small. The original vegetation consisted of hardwoods. Now, only a small acreage is wooded, and the trees are hardwoods and pines.

In uneroded areas the surface layer is yellowish-brown, friable fine sandy loam that is 4 to 6 inches thick. The subsoil is yellowish-red to red, plastic clay to a depth between 25 and 50 inches.

These soils are near areas of Dulac, Shubuta, Cuthbert, and Sumter soils. They have a finer textured and more plastic subsoil than that of the Shubuta and Cuthbert soils. They are redder and more acid than the Sumter soils.

The Boswell soils are strongly acid to very strongly acid. They are low in fertility and in organic matter. Runoff is rapid, permeability is slow, and the moisture-supplying capacity is low.

Much of the acreage of these soils is poorly suited to row crops, but the soils are fair to good for small grains, for such hay crops as alfalfa, red clover, lespedeza, and orchardgrass, and for pasture.

Boswell fine sandy loam, 2 to 8 percent slopes (BfC).—This well-drained soil occupies fairly large areas on ridgetops. It developed in coastal plain clay and sandy clay. The following describes a profile in a forested area:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 6 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, fine, granular structure; very friable.

B_1 6 to 10 inches, strong-brown (7.5YR 5/6) silty clay; moderate, fine and medium, subangular blocky structure; firm; slightly plastic when wet.

B_2 10 to 16 inches, yellowish-red (5YR 4/6) to dark-red (2.5YR 3/6) clay; strong, medium, angular blocky structure; very firm; sticky and plastic when wet.

B_3 16 to 28 inches, red (2.5YR 4/6) or yellowish-red (5YR 2/6) clay; common, yellowish-brown (10YR 5/6) and light-gray (10YR 6/1) mottles; strong, medium and coarse, subangular blocky macrostructure; strong, fine, angular microstructure; very firm; sticky and plastic when wet.

C 28 to 60 inches +, mottled olive-gray (5Y 5/2), light olive-brown (2.5Y 5/4), and yellowish-red (5YR 4/6) clay; massive; very firm; sticky and plastic when wet.

In the gently sloping, smoother areas the surface layer is commonly silt loam. The subsoil ranges from yellowish brown to yellowish red in color, and from silty clay loam to sandy clay or clay in texture. In places the soil is underlain by calcareous clay at a depth of 42 inches. In a few places there are fragments of sandstone that are 1 to 3 inches in diameter. In small areas the soil is eroded. Here, the surface layer is brown or reddish-brown, firm silty clay that is 4 to 8 inches thick. Below this is redder firm clay.

Boswell fine sandy loam, 2 to 8 percent slopes, is strongly acid to very strongly acid. It is low in fertility and moisture-supplying capacity. The surface layer is thin and is moderately permeable. The subsoil is firm and plastic and is slowly permeable. This layer limits infiltration and the amount of water that is available for plants to use.

About 60 percent of the acreage is in hardwood forests. The quality of the trees is poor. The remaining acreage is used for hay, pasture, and row crops.

This soil is better suited to small grains and to hay and pasture crops than to crops that are tilled. It can be used for tilled crops if a 3- or 4-year cropping system is used. Yields are only moderate, and in dry seasons they are low. (Capability unit IIIe–3; woodland group 5.)

Boswell fine sandy loam, 8 to 12 percent slopes (BfD).—Except for having stronger slopes, this soil is similar to Boswell fine sandy loam, 2 to 8 percent slopes. Most areas of this soil are in forests made up of cutover hardwoods of various kinds. A few small areas are in crops and pasture. In these areas the soil is moderately eroded and the surface layer is reddish-brown fine sandy loam. In a few places the firmer, red clay is exposed.

This soil has only a limited use for crops that are tilled. Careful management is required to conserve water and control erosion. A row crop could be grown every 5 or 6 years, but yields are fairly low except in seasons when the weather is favorable. Pasture plants that resist drought, hay crops, and small grains make good yields on this soil. (Capability unit VIe–2; woodland group 5.)

Boswell silty clay, 2 to 8 percent slopes, severely eroded (BoC3).—The surface layer of this soil is finer textured than that of Boswell fine sandy loam, 2 to 8 percent slopes. It consists largely of material from the former subsoil and is reddish-brown silty clay that is firm and plastic. In a few places there are gullies.

Runoff is rapid on this soil, and the moisture-supplying capacity is low. Permeability and the rate of infiltration are slow. The soil has poor tilth and is highly erodible.

Most of this soil is idle and is covered with weeds, briers, and other kinds of bushes. It is used principally for unimproved pasture, but a few areas are used for row crops.

This soil is poorly suited to crops that are tilled frequently and that require preparation of the seedbed each year. Yields are low, even if the soil is well fertilized. The soil is better suited to small grains and to pasture than to crops that are tilled. (Capability unit IVe–2; woodland group 5.)

Boswell silty clay, 8 to 12 percent slopes, severely eroded (BoD3).—Except for having stronger slopes and a thin, clayey surface layer, this soil is similar to Boswell fine sandy loam, 2 to 8 percent slopes. The surface layer, mainly material from the former subsoil, is reddish-brown or yellowish-red silty clay that is firm and plastic. In small areas redder clay from the deeper subsoil is exposed.

Because erosion has removed the fine soil material, fragments of sandstone have collected on the surface of

this soil. In a few areas gullies have dissected 15 percent of the acreage. In many areas there are a few gullies, but they are mostly shallow. There are small areas that are calcareous at a depth below 42 inches; the subsoil in these areas is not so red as that in the profile described for Boswell fine sandy loam, 2 to 8 percent slopes.

Most areas of this soil are idle. A small acreage is used for pasture, and the pastures are mostly unimproved. An even smaller acreage is used for crops that are tilled. Yields are very low.

The moisture-supplying capacity of this soil is low. Runoff is rapid, and tilth is poor. Consequently, the soil is better suited to pine trees or to grasses, legumes, and other plants that resist drought than to row crops. Because of the poor tilth, however, it is hard to get good stands of pasture plants on this soil, and yields are moderate to low. (Capability unit VIe–2; woodland group 5.)

Boswell soils, 12 to 25 percent slopes, eroded (BpE2).—This mapping unit is made up of steep soils that are moderately eroded. The soils are generally shallower but are otherwise similar to Boswell fine sandy loam, 2 to 8 percent slopes. Most of the acreage that has been cleared is now idle.

In places erosion has been severe and the present surface layer is reddish-brown or yellowish-red silty clay that is firm and plastic. In some places where the soil is shallower, the subsoil is yellowish brown and is calcareous at a depth of 42 inches. In the severely eroded areas, red clay from the former subsoil is exposed. There are fragments of sandstone lying on some areas, and there are also a few gullies in these areas. In a few areas slopes are more than 25 percent.

Tilth is poor in these soils. Runoff is rapid, and the moisture-supplying capacity is low. Therefore, these soils are better suited to pastures or to trees than to crops that are tilled.

If these soils are well managed, they are fairly well suited to legumes that resist drought. They are well suited to pine trees. (Capability unit VIIe–1; woodland group 5.)

Brandon Series

The Brandon series consists of well-drained soils that developed in a shallow mantle of loess on uplands. The loess overlies beds of acid, coastal plain gravel. Most of the acreage is in the southeastern part of the county and is in forest. Few of the areas are larger than 8 or 10 acres in size. The areas are mainly on ridgetops and upper side slopes. Slopes are dominantly 5 to 12 percent.

The surface layer of these soils is brown silt loam. The subsoil is reddish-brown or yellowish-red silty clay loam. It overlies beds of gravel at a depth between 24 and 36 inches.

These soils are adjacent to areas of the Silerton, Dulac, and Mountview soils and the Bodine-Guin complex. They are similar to the Silerton, Mountview, and Pickwick soils, which also developed in a shallow mantle of loess, but their underlying material differs. The Silerton soils are underlain by acid, coastal plain sandy clay, the Mountview by cherty limestone, and the Pickwick by old alluvium.

Brandon soils are strongly acid. They are low in natural fertility and in organic matter. Their moisture-supplying capacity is moderately low to low. The hazard of erosion is moderate to high.

Brandon silt loam, 5 to 8 percent slopes (BrC).—This well-drained soil is on the upper slopes of low hills. The following describes a representative profile in a forested area:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable.

A_2 1 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable.

B_1 7 to 12 inches, reddish-brown (5YR 4/4) silt loam; weak, fine, subangular blocky structure; friable.

B_2 12 to 34 inches, yellowish-red (5YR 4/6 to 5/6) or reddish-brown (5YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; friable; an occasional fragment of sandstone.

D_u 34 inches +, coastal plain bed of gravel; gravel is mostly chert ½ to 2 inches in diameter; contains small amounts of reddish-brown to red, sandy soil material that is mainly of sandy loam and sandy clay loam texture; 1 to 10 feet thick.

The mantle of loess is about 18 to 40 inches thick. Except in a few places on the points of ridges, the surface layer is free of gravel. The subsoil is gravelly in many places. In a few places the slope is between 2 and 5 percent. A small acreage has been moderately or severely eroded, and here the soil from a depth of about 4 to 6 inches is brown or yellowish-red silty clay loam. Shallow gullies are common in the eroded areas.

This soil is strongly acid. It is low in fertility and organic matter. The moisture-supplying capacity is moderately low. The hazard of erosion is high.

Because the soil occurs in small, isolated areas among soils that are poorly suited to agriculture, about 90 percent of the acreage is still in forest. Of the remainder, about one-third is idle, and the rest is used equally for crops and pasture.

If this soil is cultivated, a suitable cropping system would include close-growing crops at least 2 out of every 3 years. The soil is suited to all of the crops commonly grown. Fairly large amounts of fertilizer are required, and the response is only about moderate. Because they grow when moisture is more plentiful, the small grains and grasses and legumes commonly grown make higher yields than corn and other late-maturing crops. (Capability unit IIIe–1; woodland group 2.)

Brandon silt loam, 8 to 12 percent slopes (BrD).—This soil contains slightly larger amounts of sand and gravel than Brandon silt loam, 5 to 8 percent slopes. In some places the soil is moderately eroded or severely eroded. Here, the plow layer is silty clay loam 4 to 6 inches thick. Gullies are common in the eroded areas.

This soil is in small areas. Few of the areas are larger than 6 to 8 acres. Most of the acreage is in cutover hardwood forests. Areas that were once cultivated and that are moderately or severely eroded are now idle or are used for unimproved pasture.

Steep slopes and rapid runoff, low moisture-supplying capacity and fertility, and severe hazard of erosion limit the use of this soil. The soil can be used for row crops occasionally, but it is poorly suited to frequent tillage. It is fairly well suited to pasture and hay crops. Crops commonly grown on this soil respond moderately well if fertilizer is applied and the soil is otherwise well managed. The moderate yields do not justify adding large amounts of fertilizer. (Capability unit IVe–1; woodland group 2.)

Bruno Series

The Bruno series is made up of very sandy and droughty soils on nearly level bottom lands. Most of the areas lie in narrow strips adjacent to the Tennessee River, but a few areas are on flood plains of smaller streams. Slopes range from 0 to 3 percent.

The surface layer of these soils is brown loamy fine sand, 6 to 14 inches thick. It overlies brown to dark grayish-brown loamy sand or sand.

The Bruno soils are near the Huntington, Ennis, Egam, and Lindside soils. They are coarser textured, more droughty, and less productive than the Huntington and Ennis soils.

Only one soil of this series—Bruno loamy fine sand—is mapped in Hardin County.

Bruno loamy fine sand (0 to 3 percent slopes) (Bu).—This sandy, droughty soil is on flood plains. The following describes a representative profile:

A_p 0 to 6 inches, brown to dark-brown (10YR 4/3) loamy fine sand; single grain; loose.

C_1 6 to 14 inches, dark-brown (10YR 3/3) or brown (10YR 4/3) loamy fine sand; single grain; loose.

C_2 14 to 48 inches +, brown (10YR 4/3 to 5/3) or dark grayish-brown (10YR 4/2) loamy sand or sand; single grain; loose; in places contains thin strata of fine sandy loam; grades to stratified beds of sand, loamy sand, and fine sandy loam.

This soil is medium acid to slightly alkaline. It is moderately low in organic matter and plant nutrients. Because of the coarse texture and rapid movement of water through the profile the soil is very droughty.

The original forest, made up of various kinds of hardwoods, has been cleared from most areas. These areas are now used chiefly for corn, annual lespedeza, small grains, and pasture. A small acreage is idle and is sparsely vegetated. All of the areas are susceptible to flooding and have many channels and hummocks caused by overflow. In some places the soil receives fresh sediments with each overflow. In other places soil material is removed by scouring during floods.

This soil is better suited to crops that make most of their growth in spring than it is suited to other crops. Yields are generally low. Generally, it does not pay to add large amounts of fertilizer to this soil, because the supply of moisture is too low to make efficient use of it. (Capability unit IIs–1; woodland group 4.)

Captina Series

The Captina series consists of moderately well drained soils that have a fragipan. These soils developed in old alluvium washed from upland soils, mainly from limestone, but also from shale, sandstone, loess, and other kinds of material. The areas are level to sloping. They are mainly on stream terraces along the Tennessee River and tributary streams that flow through areas underlain by limestone.

The surface layer, chiefly brown or dark grayish-brown, friable silt loam, is 7 to 10 inches thick. The subsoil is yellowish-brown, friable or firm silty clay loam to a depth of about 24 inches. Below this is a fragipan of mottled, firm silty clay loam.

These soils are near the Wolftever, Sequatchie, Humphreys, Beason, and Robertsville soils on stream terraces and near the Ennis, Lobelville, and Lee soils on flood plains. In contrast to the Wolftever soils, which have a compacted subsoil, the Captina soils have a well-developed fragipan. The Captina soils occupy positions similar to those of the Sequatchie and Humphreys soils, which are well drained. Captina soils are better drained and are browner than the Beason soils.

These soils are medium acid to strongly acid and are moderate in fertility. They are easy to work and generally have good tilth. The use of these soils for agriculture is slightly limited because the slowly permeable fragipan slows movement of water and air and penetration of roots. The soils are suited to corn and cotton, to small grains, to such hay crops as red clover, lespedeza, and orchardgrass, and to pasture.

Captina silt loam, 2 to 5 percent slopes, eroded (CaB2).—This moderately well drained soil is on low stream terraces. It has a fragipan at a depth of about 2 feet. The following describes a representative profile in a cultivated area:

A_p 0 to 9 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable.

B_1 9 to 14 inches, yellowish-brown (10YR 5/4) coarse silty clay loam; moderate, fine, subangular blocky structure; friable.

B_2 14 to 24 inches, yellowish-brown (10YR 5/4) silty clay loam; a few, fine, faint, light brownish-gray (10YR 6/2) mottles; moderate, fine and medium, subangular blocky structure; slightly plastic and sticky when wet; few to common, small, black and brown concretions.

B_{3m1} 24 to 28 inches, light yellowish-brown (10YR 6/4) silty clay loam; common, fine, faint mottles of yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and gray (10YR 6/1); moderate, medium, angular blocky structure; firm, a few, small, black and strong-brown concretions and specks; occasional to common fine pebbles that are mostly chert.

B_{3m2} 28 to 45 inches, mottled yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), light-gray (10YR 6/1), and strong-brown (7.5YR 5/6) silty clay loam; moderate, medium, angular blocky structure to massive; firm; compact; a few, small, black and strong-brown concretions; a few small chert pebbles.

C 45 to 60 inches +, mottled light-gray, light brownish-gray, light yellowish-brown, yellowish-red, and brown silty clay loam or coarse silty clay; moderate, coarse, angular blocky structure; firm; common small chert pebbles; a few strong-brown and black stains and small concretions.

There are about 200 acres where the soil does not have a fragipan. In these areas the surface layer, a brown fine sandy loam, overlies a subsoil of mottled yellowish-brown and gray clay loam.

Captina silt loam, 2 to 5 percent slopes, eroded, is medium acid to strongly acid. It is moderate in fertility and in organic matter. The moisture-supplying capacity is moderately low to moderately high. The soil above the fragipan is penetrated easily by roots, but the fragipan restricts growth of deep-rooted plants. Air and water move very slowly through the soil at a depth below 2 feet. This soil has good tilth and is easy to work. Most areas are likely to be flooded during spring and early in summer, and the soil is fairly slow to warm in spring.

This soil is suited to all of the crops commonly grown, except possibly alfalfa. Alfalfa grows well for 1 or 2 years, but the stand thins rapidly because there is too much water in the lower subsoil. Fertilizer is required for good yields of all crops. The response to fertilizer is good

enough to justify adding moderately large amounts. (Capability unit IIe–2; woodland group 3.)

Captina silt loam, 0 to 2 percent slopes (CaA).—This soil has smoother slopes and is less likely to erode, but it is otherwise similar to Captina silt loam, 2 to 5 percent slopes, eroded. It is on low stream terraces. The areas are medium to fairly large.

The surface layer is brown to dark grayish-brown, friable silt loam that is 7 to 10 inches thick. The subsoil is yellowish-brown, firm silty clay loam to a depth between 24 and 28 inches. It overlies a mottled, firm fragipan that extends to a depth of about 4 feet.

This soil is medium acid to strongly acid. It is moderately low in fertility. The fragipan restricts movement of water and air through the soil and keeps roots from penetrating deeply. Most areas are susceptible to periodic flooding in winter or in spring.

Practically all of this soil is used for summer annual crops and for pasture. Only a few small areas remain in a forest of mixed hardwoods.

This soil can be cultivated frequently. It is suited to cotton, corn, soybeans, grain sorghum, and pasture crops. Yields are good. Alfalfa generally does not grow well or last long, because the lower subsoil is wet in winter. The soil responds well to management. Fertilizer is required, and the response is good enough to justify adding moderately large amounts. (Capability unit IIw–2; woodland group 3.)

Captina silty clay loam, 2 to 8 percent slopes, severely eroded (CbB3).—The surface layer of this soil is finer textured than that of Captina silt loam, 2 to 5 percent slopes, eroded, and the solum is thinner. The surface layer consists largely of material from the former upper subsoil. It is yellowish-brown silty clay loam that is friable. Depth to the fragipan ranges from 12 to 18 inches.

In areas where the soil is even more severely eroded, the fragipan is exposed. There are a few shallow gullies in the steepest areas. A few pebbles and small concretions occur in places.

Most of this soil is in small areas and is used along with other areas of Captina soils. A few areas that once were cultivated now have a thick cover of small deciduous trees.

This soil is suitable for only occasional cultivation. It is better suited to small grains, hay, and pasture plants than to row crops. Tall fescue, lespedeza, whiteclover, bermudagrass, and sericea lespedeza are suitable plants. Moderately large amounts of fertilizer are required for all crops. Corn, cotton, and other row crops make only moderate to low yields, even if the soil is well fertilized. (Capability unit IVe–3; woodland group 3.)

Colbert Series

The Colbert series consists of moderately well drained, clayey soils that are fairly shallow. These soils developed in material weathered from shaly or clayey limestone. They lie on rolling to hilly areas in the valleys throughout the eastern half of the county. The areas are small to medium in size. Most of the acreage is in forest.

The surface layer, a thin, light olive-brown silty clay loam, is firm and plastic. The subsoil is light olive-brown to dark yellowish-brown clay that is very firm and is sticky and plastic.

These soils occur with the Talbott soils and with areas of Rock land. They are shallower, finer textured, and more plastic than the redder Talbott soils and are less well drained.

The Colbert soils are medium acid to neutral. Their moisture-supplying capacity is low. They are slowly permeable and are hard to keep in good tilth.

Colbert silty clay loam, 5 to 12 percent slopes (CcD).—This moderately well drained soil is fairly shallow. It is on sloping uplands underlain by limestone. The following describes a representative profile in a forested area:

A_{00} 1½ inches to 1 inch of forest litter.
A_0 1 inch or less of leaf mold and partly decomposed forest litter.
A_1 0 to 2 inches, dark grayish-brown (2.5Y 4/2) silty clay loam; moderate, fine, granular structure; friable.
A_2 2 to 6 inches, light olive-brown (2.5Y 5/4) silty clay; moderate to strong, fine, granular structure; firm; sticky and plastic when wet.
B_2 6 to 16 inches, light olive-brown (2.5Y 5/4 to 5/6) clay; common to many, fine mottles of brownish yellow (10YR 6/6) and light yellowish brown (2.5Y 6/4); medium, angular blocky structure; very firm; very sticky and plastic when wet; continuous clay films of dark grayish brown and olive gray; common, small, black concretions and stains.
C 16 to 24 inches, olive-brown (2.5Y 4/4) clay or mottled olive (5Y 5/3), olive-gray (5Y 5/2), and light olive-brown (2.5Y 5/4) clay; massive; very firm; very sticky and plastic when wet; common, small, black concretions and stains.
D_r 24 inches +, clayey limestone with thin layers of shale; many feet thick.

The depth to bedrock is 1 or 2 feet. In places outcrops of bedrock are common. The texture of the surface layer ranges from fine silt loam to clay. In places a few fragments of chert and flaggy limestone are common.

This soil has poor tilth. The rooting zone is shallow. Infiltration is slow, and runoff is rapid. The moisture-supplying capacity is low.

Most of the areas are in forests made up chiefly of cutover mixed hardwoods and cedar. The cleared areas are mostly moderately and severely eroded. Most of them are idle and are reverting to forest. Only a small acreage is used for pasture. The pastures are largely unimproved and furnish only seasonal grazing. Except for areas that are irregular in size and are used along with other adjacent soils, little of this soil is used for crops. Good stands are difficult to obtain, and yields are low.

The soil is better suited to bermudagrass, tall fescue, sericea lespedeza, and other grasses and legumes that resist drought than it is suited to row crops. Small grains make fair yields if the soil is well managed. Pastures make little growth in summer but grow well in spring, particularly if nitrogen fertilizer is applied. (Capability unit IVe–2; woodland group 6.)

Colbert silty clay loam, 12 to 25 percent slopes (CcE).—This soil is shallower than Colbert silty clay loam, 5 to 12 percent slopes. In places there are outcrops of limestone bedrock. Nearly all of the areas are in forests that consist mainly of mixed hardwoods but that include a scattering of cedar. A few areas have been severely eroded, and here gullies are common. Most of these gullied areas are used for unimproved pasture or are reverting to forests made up of cedar trees.

This shallow, steep soil has low moisture-supplying capacity and is subject to erosion. It is best used for forests or perhaps for limited grazing. Row crops and other

crops that require preparation of the seedbed each year are poorly suited. Yields of pastures are low, and the plants make most of their growth in spring. Moderate amounts of fertilizer are required to obtain even low yields, and the response does not justify adding large amounts of fertilizer. (Capability unit VIe–2; woodland group 6.)

Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes (CeE).—Much of this mapping unit is in small areas scattered throughout the eastern part of the county in valleys underlain by limestone. The areas occupied by either soil in the complex vary from place to place, but the largest part of any area is generally occupied by the Colbert soil.

Outcrops, chiefly massive limestone that is interbedded with small pieces of shale and limestone, occupy 10 to 25 percent of the surface area. Between the rocks is grayish-brown to yellowish-brown, plastic silty clay loam that is 4 or 5 inches thick. This material is underlain by subsoil of yellowish-red or light olive-brown, firm clay or silty clay.

Runoff is rapid, and internal drainage is slow to medium. The moisture-supplying capacity and supply of plant nutrients are low. The soils are slowly permeable and are difficult to work and manage.

This mapping unit is poorly suited to row crops or to pasture. There is enough soil material between the rocks to produce a small amount of forage, but the outcrops prevent tillage. The outcrops also make it difficult to mow the areas and to control weeds. Most of the acreage is in forest consisting of cedars and mixed hardwoods. Only a small acreage is cleared, and it is used for pasture. (Capability unit VIIs–1; woodland group 9.)

Colbert-Talbott very rocky clays, 8 to 25 percent slopes (CdE).—This mapping unit is made up of soils that have numerous outcrops of limestone. The soil between the rocks is clayey and plastic.

Most of the acreage is idle or has reverted to trees, chiefly cedars or mixed hardwoods and cedars. A small acreage is used for pasture. The pastures are largely unimproved, but they furnish fair seasonal grazing, mainly in spring.

Because yields are low and the rocks prevent the use of farm machinery, the areas are not suited to cultivated crops. Their best use is for trees. (Capability unit VIIs–1; woodland group 9.)

Collins Series

The Collins series is made up of moderately well drained soils on first bottoms. The soils consist of sediments washed from soils on uplands that formed in loess and coastal plain materials. These nearly level soils are along narrow drainageways. The areas are mainly in the western part of the county. Slopes are short and range from 1 to 3 percent.

The uppermost 18 inches of the soil profile is brown silt loam, loam, or fine sandy loam. Beginning at a depth of 18 inches, there are a few gray mottles, but below 22 inches there are many mottles.

The Collins soils are near the Vicksburg, Falaya, and Mantachie soils, which are on level bottoms. On adjoining low terraces are the Freeland and Hatchie soils. The Collins soils are not so well drained at a depth below 18 inches as the Vicksburg soils. They are better drained, are browner, and are less mottled than the Falaya and Mantachie soils. The Collins soils are similar to the Lindside and Lobelville soils. The Lindside soils, however, developed from recent alluvium made up of material weathered from chert-free limestone, and the Lobelville, from alluvium made up of material weathered from cherty limestone.

The Collins soils are medium acid to strongly acid. They are moderate in fertility. Their moisture-supplying capacity is high. These soils are easy to work and manage. Response to fertilizer is high. In many places the soils are subject to flooding. As a result, planting is often delayed in spring.

These soils are used principally for corn, soybeans, grain sorghum, cotton, and other row crops. Yields are high.

Collins fine sandy loam (0 to 2 percent slopes) (Cf).—This moderately well drained soil is on bottom lands. The following describes a representative profile:

A_p 0 to 8 inches, brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable.

C_1 8 to 20 inches, brown (10YR 5/3) or yellowish-brown (10YR 5/4) fine sandy loam; weak, fine, granular structure; very friable; few to common, fine mottles of light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) in the lower part.

C_2 20 to 30 inches, mottled light brownish-gray (10YR 6/2), grayish-brown (10YR 5/2), yellowish-brown (10YR 5/4), and light-gray (10YR 6/1 to 7/2) silt loam or loam; weak, fine, granular structure; very friable.

C_{3g} 30 to 40 inches +, light-gray (10YR 6/1 to 7/1) fine sandy loam; many mottles of light brownish gray (10YR 6/2), light yellowish brown (2.5Y 6/4), and yellowish brown (10YR 5/6); weak, fine or medium, granular structure; friable.

In a few places the profile is silt loam throughout. In other places the profile is silty in the upper part and the material in the lower part is very sandy.

Collins fine sandy loam is medium acid to strongly acid. It is moderately fertile and is high in moisture-supplying capacity. Runoff is slow, but permeability is rapid to moderately rapid. The water table is high during wet seasons. This soil is easy to work, and it responds well to lime and fertilizer. It is subject to frequent overflow, especially in winter and in spring.

Practically all of the acreage of this soil is used for summer annual crops; only a small acreage is used for hay. Corn, cotton, soybeans, and grain sorghum are the principal crops. Excess water commonly delays planting in spring, and crops are sometimes damaged by floods.

The soil is well suited to intensive cultivation because it is nearly level, is productive, and does not erode readily. It is suited to all of the crops commonly grown, but alfalfa does not do so well as on the higher lying, better drained soils. (Capability unit I–1; woodland group 4.)

Collins loam, local alluvium (1 to 3 percent slopes) (Cg).—This soil is along small drainageways, in slight depressions on uplands, and at the base of slopes. It is more sloping than Collins fine sandy loam, and the surface layer is finer textured. Also, water runs off more readily, and the areas are less susceptible to flooding.

This soil formed in local alluvium washed largely from the Silerton, Dulac, Pickwick, and Paden soils. The texture ranges from silt loam to fine sandy loam, but in places, especially in the lower part of the profile, the texture is coarser.

The drainage limits the use of this soil only slightly. Crops on this soil respond well if fertilizer is added, and yields are good enough to justify adding large amounts of fertilizer. Alfalfa generally does not last long, because of slow drainage in the lower subsoil and vigorous competition from weeds. (Capability unit I–1; woodland group 4.)

Collins silt loam (0 to 2 percent slopes) (Ch).—The surface layer of this soil is finer textured than that of Collins fine sandy loam, but the soils are otherwise similar. The areas are also about equal in size and are distributed about the same.

The surface layer is silt loam, but strata of fine sandy loam, loam, or loamy sand of variable thickness have been deposited throughout the profile.

Most areas of this soil are used for corn, cotton, grain sorghum, and hay. Yields are slightly higher than on Collins fine sandy loam because this soil holds more water available for crops during dry periods.

Collins silt loam is suited to intensive use for crops that are tilled. Cotton, corn, soybeans, vegetable crops, and hay crops grow well. Tall fescue, white clover, and red clover are suitable pasture plants. All crops require lime and fertilizer for high yields, and they respond well if lime and fertilizer are applied. In some areas flooding limits the use of this soil to summer annual crops. (Capability unit I–1; woodland group 4.)

Culleoka Series

The Culleoka series consists of moderately deep soils that are well drained. The soils formed chiefly in material from porous, fine-grained, phosphatic sandstone that included small amounts of sandy shale and sandy limestone. These rolling to steep soils are in the eastern part of the county. The areas are small. They are near Olivehill and are also widely distributed throughout valleys that are underlain by limestone.

The surface layer, a brown, friable silt loam, is 6 to 8 inches thick. The subsoil is strong-brown or yellowish-brown, friable silty clay loam to a depth between 15 and 20 inches. Just below is the substratum of yellowish-red or strong-brown silty clay loam. It rests on bedrock at a depth between 35 and 45 inches.

These soils are near the Bodine soils and the Dandridge-Needmore complex, but they occupy areas below those soils.

The Culleoka soils are moderate in natural fertility. They are slightly acid to strongly acid. The content of phosphorus ranges from moderately low to high. In areas where the slopes are not too steep, these soils are moderately productive of the crops commonly grown in the county.

Culleoka silt loam, 5 to 12 percent slopes (CkD).—This well-drained, phosphatic soil is in small areas on narrow ridgetops in the eastern part of the county. The following describes a profile in a forested area:

A_1 0 to 1 inch, very dark grayish-brown (10YR 3/2) silt loam mingled with dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; very friable.

A_2 1 to 6 inches, brown (10YR 5/3 to 4/3) silt loam; weak, fine, granular structure; friable.

B_1 6 to 10 inches, strong-brown (7.5YR 5/6) or yellowish-brown (10YR 5/4) coarse silty clay loam; weak, fine to medium, subangular blocky structure; friable; few to common, fine pebbles of sandstone.

B_2 10 to 15 inches, strong-brown (7.5YR 5/6) silty clay loam, a few brown (7.5YR 4/4) to brownish-yellow (10YR-6/6) variegations; moderate, medium, subangular blocky structure; friable; few to common, small pebbles of sandstone.

C 15 to 30 inches, yellowish-red (5YR 5/6) or strong-brown (7.5YR 5/6) coarse silty clay loam; a few yellowish-brown or brownish-yellow variegations; many fragments of sandstone; friable.

D_r 30 to 48 inches +, bedrock of porous, fine-grained, phosphatic sandstone.

In most places depth to bedrock ranges from 1 to 4 feet. The bedrock is Hardin sandstone and generally is 1 to 16 feet thick. The content of phosphorus varies. Apparently, the darker colored bedrock contains more phosphorus than the lighter colored rock. Fragments of sandstone ½ to as much as 4 inches thick are common throughout the solum in many places. On the steepest slopes bedrock outcrops in ledges. In small areas fragments of sandstone, some of which are as large as boulders, are common.

This soil is slightly acid to strongly acid. It is permeable and is easily penetrated by plant roots. The soil is moderate in plant nutrients and organic matter, and it is moderately low in moisture-supplying capacity. It is easy to work and has good tilth. In places outcrops of bedrock interfere with the use of farm machinery. The moderately eroded and severely eroded areas are shallow to bedrock, and in these the moisture-supplying capacity is low.

Most of the acreage has a forest cover that consists mainly of various kinds of deciduous trees. A small acreage has been cleared and used for crops and pasture. The cleared areas are mostly moderately eroded and severely eroded; they are small and are located in remote places. These areas are now idle or are used for unimproved pasture.

Crops that are cultivated make fair to good yields on this soil, but the soil should be cultivated only occasionally. Moderate amounts of fertilizer are required, and the crops respond moderately well if fertilizer is applied. The soil is suited to all of the pasture plants commonly grown. Yields of forage are fair to good. The soil should be tested before applying fertilizer that contains phosphorus because much of this soil is high in phosphorus. (Capability unit IIIe–1; woodland group 6.)

Culleoka silt loam, 12 to 35 percent slopes (CkF).—This soil has stronger slopes than Culleoka silt loam, 5 to 12 percent slopes, and is shallower to bedrock. In a few places there are outcrops of sandstone bedrock, but fragments of sandstone are common on the surface. There are outcrops of limestone bedrock on the lower part of the slopes. In many places creep material from the higher lying areas covers the soil.

About two-thirds of this soil is in forests of mixed hardwoods. The remaining acreage is used for unimproved pasture. Because yields are low, cultivated crops are not commonly grown.

This shallow, steep soil has low moisture-supplying capacity and is susceptible to further erosion. Consequently, it is better suited to pasture or trees than to crops that are tilled. Orchardgrass, whiteclover, tall fescue, and bermudagrass are suitable plants. Yields are fair to good. (Capability unit VIe–1; woodland group 6.)

Cuthbert Series

The Cuthbert series consists of moderately well drained soils that developed in stratified, thin-bedded, coastal plain clay and sandy clay. These soils are in highly dissected, rolling to steep areas. The areas are small to moderately large in size; most of them are in the northwestern part of the county.

In uneroded areas the surface layer is light yellowish-brown, very friable fine sandy loam that is 5 to 6 inches thick. The subsoil to a depth between 10 and 15 inches is yellowish-red or red, firm sandy clay. It is underlain by stratified and variegated beds of red to gray sandy clay, clay, and sand.

These soils commonly lie alongside or are near the Shubuta, Ruston, Susquehanna, and Boswell soils. Their profile is thinner and less well developed than that of the Shubuta soils, which developed in similar parent materials. Their subsoil is thinner and finer textured than that of the Ruston soils and coarser textured and less plastic than that of the Boswell soils.

Cuthbert soils are low in fertility. They are medium acid to strongly acid. Their surface layer is easy to work, but it is thin and is underlain by clayey material that has poor tilth. These soils erode readily when cultivated. They are droughty and do not respond well to management.

Because slopes are steep and it is hard to keep the soils from eroding, little of the acreage is suitable for cultivation. Generally, these soils are better suited to trees or to pasture than to crops that are tilled.

Cuthbert fine sandy loam, 12 to 25 percent slopes (CnE).—This moderately well drained soil is on uplands where it developed in shallow or stratified coastal plain clay and sand. The following describes a representative profile in a forested area:

A_1 0 to 1 inch, very dark gray (10YR 3/1) fine sandy loam; weak, fine granular structure, very friable.

A_2 1 to 5 inches, light yellowish-brown (10YR 6/4) fine sandy loam; weak, fine, granular structure.

B_2 5 to 13 inches, yellowish-red (5YR 4/6) sandy clay; moderate to strong, fine or medium, subangular blocky structure; firm or very firm; slightly plastic when wet.

C 13 to 30 inches +, variegated red (2.5YR 4/6) or yellowish-red (5YR 4/6), yellowish-brown (10YR 5/6), and gray, stratified sandy clay or clay loam; thin seams or lenses of yellowish sand and gray clay.

The solum ranges from 8 to 15 inches in thickness. Where the solum is thickest, the upper part of the subsoil is a thin sandy clay loam or clay loam in places. In most places the C layer becomes grayer and finer textured with increasing depth.

The color of the stratified substratum ranges from gray to dark red. In places rust-colored fragments and pebbles of sandstone are common. In small areas the soil is moderately eroded and severely eroded. In these areas the present surface layer is brown to reddish-brown fine sandy loam to sandy clay loam that is 4 to 6 inches thick.

Cuthbert fine sandy loam, 12 to 25 percent slopes, is strongly acid. It is very low in plant nutrients, in organic matter, and in moisture-supplying capacity. Runoff is medium to rapid, and internal drainage is slow to medium. The surface layer is rapidly permeable, but the subsoil is slowly permeable. The soil is susceptible to erosion.

Most of this soil is in forests that consist of cutover hardwoods. The cleared areas are used mostly for pasture or are idle.

This soil is not suited to row crops. Pastures produce fair amounts of forage, but fairly large amounts of fertilizer are required. Plants that tolerate drought are suitable for pastures. The soil is well suited to pine trees. (Capability unit VIIe–1; woodland group 5.)

Cuthbert fine sandy loam, 25 to 35 percent slopes (CnF).—This soil is shallow over stratified coastal plain clay and sand. In areas that are not eroded, the surface layer is yellowish-brown fine sandy loam that is about 5 inches thick. The subsoil, a yellowish-red sandy clay, extends to a depth of about 12 inches. It is underlain by stratified coastal plain materials. In a few severely eroded areas, variegated clay and sand are exposed.

Most of the acreage of this soil is used for trees, and this is probably the best use. The slopes are too steep, the soil is too erodible, and yields of forage are too low for pastures to be profitable. (Capability unit VIIe–1; woodland group 5.)

Cuthbert-Ruston complex, 12 to 35 percent slopes (CrF).—This complex is made up of Cuthbert and Ruston soils that occur together in areas that are too small to map separately. The Cuthbert soils are moderately well drained, but the Ruston soils are well drained. The pattern in which the soils occur is variable, and their characteristics are variable. The areas are highly dissected. Slopes are long and irregular. Most of the acreage is near Coffee Landing and the community of Right.

The Cuthbert soils developed in stratified coastal plain sandy clay and clay that contained thin lenses of sand. The Ruston soils formed in thick beds of coastal plain sandy clay loam that contain layers of sand or sandy loam.

The surface layer of these soils is very friable fine sandy loam. The subsoil of the Cuthbert soils is yellowish-red to red, firm sandy clay to clay, but that of the Ruston soils is yellowish-red, friable sandy clay loam. Rust-colored fragments and pebbles of sandstone are common on the surface and throughout both soils. For a detailed description of a typical Cuthbert profile, turn to the description of Cuthbert fine sandy loam, 12 to 25 percent slopes, and for a similar description of a Ruston profile, to Ruston fine sandy loam, 5 to 8 percent slopes.

The Cuthbert and Ruston soils are strongly acid and are droughty. The soils are low in plant nutrients, in organic matter, and in moisture-supplying capacity. Runoff is medium to rapid. Internal drainage and permeability are slow for the Cuthbert soils and rapid for the Ruston.

The topography of areas occupied by these soils is similar to that of areas occupied by Shubuta and Waynesboro soils.

Except for a few moderately eroded and severely eroded areas, most areas of Cuthbert-Ruston complex, 12 to 35 percent slopes, are in forests. The trees are mixed hardwoods and pines or are mixed hardwoods. The forests have been cut over several times, and the present stands have little timber that is marketable. The areas that once were in crops are now idle and are reverting to native trees.

This mapping unit is better suited to trees than to crops or pasture. Grasses and legumes that resist drought grow

fairly well on the less steep areas if fertilizer is added and the soils are otherwise well managed. (Capability unit VIIe-1; woodland group 5.)

Cuthbert and Susquehanna soils, 5 to 12 percent slopes (CsD).—This mapping unit is made up of Cuthbert and Susquehanna soils that are so closely associated it was not practical to map them separately. The soils formed in acid coastal plain sandy clay and clay. The areas are in the northwestern part of the county. They are highly dissected and have narrow ridgetops and moderately steep side slopes. The areas may consist of one or of both soils.

A profile of the Cuthbert soil is described in detail under Cuthbert fine sandy loam, 12 to 25 percent slopes. The following describes a representative profile of Susquehanna fine sandy loam, on slopes of 5 to 12 percent, as it occurs in this complex:

A_1 0 to 1 inch, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 5 inches, brown (10YR 5/3) fine sandy loam; weak, fine, subangular blocky structure; very friable.

B_2 5 to 15 inches, dark reddish-brown (5YR 3/4) clay; many, fine, prominent mottles of olive gray (5Y 5/2); strong, fine, angular blocky structure; firm; sticky and plastic when wet, very hard when dry; a few mica flakes.

C_1 15 to 42 inches, mottled gray (5Y 5/1), dark-gray (10YR 4/1), dark grayish-brown (2.5Y 4/2), and red (2.5YR 4/6) clay; weak, fine, angular blocky structure to massive; very firm; sticky and plastic when wet; clay is shaly in places; mica flakes are common.

D_u 42 inches +, sand and clay of the Eutaw formation.

The Cuthbert soils are more friable than the Susquehanna soils and are not so strongly mottled. Depth to the stratified, more sandy coastal plain material ranges from 2 to 6 feet.

These soils are low in plant nutrients and organic matter. They are strongly acid. Runoff is rapid. The moisture-supplying capacity is low. Root penetration is shallow. Internal drainage is slow in the Susquehanna soils, but it is more rapid in the Cuthbert soils.

Much of the acreage of this mapping unit is in forest. The trees are hardwoods of poor quality. A small acreage has been used for crops, and in places the areas have been moderately eroded and severely eroded. The surface layer in the eroded places is reddish-brown clay or sandy clay. Gullies are common. Most of the areas that were formerly used for crops are reverting to native trees. Some of the areas are used for unimproved pasture, and pines have been planted on several areas.

Cuthbert and Susquehanna soils, 5 to 12 percent slopes, can be cultivated occasionally. The soils are better suited to small grains, hay, and other close-growing crops than to corn, cotton, and other crops that are cultivated. Grasses and legumes that resist drought can be grown if the soils are well managed. Yields are fair. (Capability unit VIe-2; woodland group 5.)

Dandridge Series

The Dandridge series consists of shallow soils that are well drained. These soils developed in material weathered from calcareous shale that was interbedded with thin lenses of limestone. Areas of these soils are highly dissected.

The surface layer is commonly brown shaly silt loam. It is underlain by yellowish-brown shaly silt loam to silty clay loam. Depth to shale bedrock is generally about 16 inches but ranges from 6 to 22 inches.

These soils are adjacent to the Needmore soils. They are shallower than those soils and are not so acid. Also, unlike those soils, they lack a well-developed B horizon.

These soils are slightly acid, and they are moderate in fertility. The steep slopes, shallow root zone, and serious hazard of erosion limit the use of the soils. Most of the acreage is in forests. The trees are mainly mixed hardwoods, but there are also a few cedars.

Because the areas are small and intricately mixed with the moderately deep Needmore soils, the Dandridge soils are not mapped separately in this county. They are mapped in two complexes with the Needmore soils, which are mapped only with the Dandridge soils in this county. A profile of a soil in each of these two series is described under the following mapping unit.

Dandridge-Needmore complex, 12 to 35 percent slopes (DaF).—This complex is made up of Dandridge and Needmore soils that are so intermixed that it was not practical to map them separately. The soils are well drained. Bedrock of calcareous shale is near the surface in the Dandridge soils, but in the Needmore soils it is moderately deep to deep. The Dandridge soils are on the higher parts of side slopes or the upper parts of narrow ridgetops, but the Needmore soils are on benchlike areas or on the lower parts of slopes.

The surface layer of the Dandridge soils is brown shaly silt loam. It is underlain by yellowish-brown shaly silt loam to silty clay loam. Dandridge soils lack a well-developed B horizon. The surface layer of the Needmore soils is browner silt loam than that of the Dandridge. It is underlain by a well-developed, yellowish-brown and strong-brown to yellowish-red subsoil of silty clay loam to silty clay.

The following describes a representative profile of a Dandridge soil in a cultivated area:

A_p 0 to 4 inches, brown to dark-brown (10YR 4/3) shaly silt loam; weak to moderate, fine, granular structure; very friable.

C_1 4 to 10 inches, yellowish-brown (10YR 5/4) shaly silt loam; weak, very fine, subangular blocky structure; friable.

C_2 10 to 16 inches, yellowish-brown (10YR 5/4) shaly silt loam or coarse silty clay loam; contains more fragments of shale than the C_1 layer; weak, fine, subangular blocky structure.

D_r 16 inches +, light olive-brown (2.5Y 4/4) or olive-brown (2.5Y 5/4) to gray shale and shaly limestone; the shale is olive and yellowish red in a few places, and it ranges from strongly acid to mildly alkaline.

The soil varies in depth to bedrock, in the number of fragments of shale in the surface layer, and in reaction. Depth to bedrock ranges from 6 to about 22 inches. The shale bedrock outcrops chiefly as ledges. In a few places on the lower part of the slope, there are outcrops of limestone and sandstone bedrock. In many places the surface layer is free of shale. Near Russell Chapel and Cerro Gordo there are about 234 acres of shaly soils that have slopes of 8 to 45 percent and are phosphatic but are otherwise similar to the Dandridge soil.

Included with this soil are areas of Minvale soils that formed in material from cherty limestone at higher elevations than the Dandridge soil. These included areas were too intermixed to map separately.

The following describes a representative profile of a Needmore silt loam in a forested area:

A_1 0 to ½ inch, grayish-brown silt loam; weak, fine, granular structure; friable.
A_2 ½ to 3 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure to weak, fine, subangular blocky structure; friable.
B_1 3 to 9 inches, yellowish-brown (10YR 5/6) and brownish-yellow (10YR 6/6) silty clay loam; weak, fine to medium, subangular blocky structure; moderately friable.
B_2 9 to 29 inches, strong-brown (7.5YR 5/6) to yellowish-red (5YR 5/6) silty clay; moderate, medium, subangular blocky structure; firm.
B_3 29 to 36 inches, yellowish-red (5YR 5/6) and red (2.5YR 4/6) silty clay; moderate, medium, subangular blocky structure; firm to very firm.
C 36 inches +, yellowish-red (5YR 5/8) silty clay or clay; few to common, fine, faint variegations of strong brown, yellowish brown, and red.

This Needmore soil varies chiefly in the thickness of the profile. The surface layer is brown to dark grayish brown and is 4 to 6 inches thick. The subsoil is yellowish-brown to yellowish-red silty clay or clay; it is 9 to 30 inches thick.

Many areas of the Needmore soil have some creep or slopewash over them. This material is from the cherty Bodine soils, which are on steep slopes above the Needmore. In some places this overwash is as much as 2 feet thick.

Runoff is rapid or very rapid on the Dandridge and Needmore soils. Internal drainage is medium to rapid. The soils are low in moisture-supplying capacity and moderate to moderately low in natural fertility. The Dandridge soils are slightly acid, and the Needmore are strongly acid. The hazard of erosion is severe on both of these soils.

Most of the acreage of this complex is in forests. The trees are mainly mixed hardwoods, but there are also a few cedars. Areas that have been cleared are used for unimproved pastures or are reverting to native trees.

This mapping unit is poorly suited to crops that are tilled. Fair amounts of forage are produced in spring and early in summer on the mildest slopes of the Needmore soil. The pastures dry quickly, and weeds are hard to control in them. Bluegrass, ryegrass, tall fescue, whiteclover, annual lespedeza, and bermudagrass are suitable pasture plants. (Capability unit VIe–2; woodland group 6.)

Dandridge-Needmore complex, 8 to 12 percent slopes (DaD).—Except for milder slopes, this unit is similar to Dandridge-Needmore complex, 12 to 35 percent slopes. It is on benchlike areas below tracts of that complex. The areas are small and access to them is difficult.

Much of the acreage of this complex is in forests that consist of hardwoods and cedars. About 10 percent of the acreage has been used for crops; these areas have been severely eroded. A few areas are used for unimproved pasture or are idle.

Because shale is fairly near the surface, fertility is moderately low, and the hazard of erosion is severe, these soils are poorly suited to crops that are tilled. If adequate amounts of fertilizer are applied and the soils are otherwise well managed, small grains and pasture and hay crops will make fair yields. The soils are well suited to the pasture plants that are commonly grown, but they are better suited to the ones that mature early. (Capability unit IVe–2; woodland group 6.)

Dexter Series

The Dexter series is made up of deep, well-drained soils on stream terraces. These soils developed in old alluvium that was washed from loess and from soils on uplands of the Coastal Plain. The areas are undulating to hilly. They are small to medium in size and are widely distributed throughout the Coastal Plain. The largest acreage is in the northwestern part of the county near White Oak, Middleton, and Hurricane Creeks.

In areas that are not eroded, the surface layer is brown, very friable loam that is 6 to 12 inches thick. The subsoil is yellowish-red or reddish-brown, friable clay loam that becomes redder and more sandy with increasing depth.

These soils are near the Freeland soils, which are moderately well drained; the Hatchie, which are somewhat poorly drained; and the Almo, which are poorly drained. They have a browner and redder subsoil than the Freeland soil, and, unlike those soils, they lack a fragipan.

The Dexter soils are medium acid to strongly acid. They are moderate in fertility and organic matter. Throughout the profile the soils are permeable and friable. Tilth is good, and the root zone is deep. The soils respond well to management. They are suited to crops that are cultivated, to pastures, and to trees.

Dexter loam, 2 to 5 percent slopes, eroded (DeB2).—This deep, well-drained, moderately fertile soil is on stream terraces. The following describes a representative profile:

A_p 0 to 8 inches, brown to dark-brown (10YR 4/3) loam; weak, fine, granular structure; very friable.
B_1 8 to 15 inches, reddish-brown (5YR 4/4) clay loam; weak, fine, subangular blocky structure; friable.
B_{21} 15 to 32 inches, reddish-brown or yellowish-red (5YR 4/4 to 4/6) silty clay loam or clay loam; moderate, fine or medium, subangular blocky structure; friable.
B_{22} 32 to 38 inches, yellowish-red (5YR 4/6), red, or dark-red (2.5YR 4/6 to 3/6) clay loam; a few brown and yellowish-brown variegations; moderate, medium, subangular blocky structure; friable.
C 38 to 50 inches +, yellowish-red (5YR 4/6), red, or dark-red (2.5YR 4/6 to 3/6) clay loam or sandy clay loam; weak, coarse, angular blocky structure or massive; friable; commonly variegated with shades of brown, yellowish brown, and gray.

The thickness of the alluvium ranges from about 4 to 12 feet. The texture of the surface layer is silt loam and fine sandy loam, and that of the subsoil is clay loam or silty clay loam. In some areas there is a buried B_2 horizon, rather than a C horizon. The higher lying areas have a thin capping of loess. In some places the soil developed in local alluvium on foot slopes and on benches.

This soil is medium acid to strongly acid. It is moderately high in organic matter, in plant nutrients, and in moisture-supplying capacity. The soil is permeable, and roots penetrate it easily.

Dexter loam, 2 to 5 percent slopes, eroded, is desirable for crops that are cultivated. It is productive and responds well to good management. The soil is well suited to cotton, corn, small grains, alfalfa and hay crops. If the crops are grown in a moderately short cropping system that includes a mixture of grasses and legumes, yields are high. Pastures of tall fescue, orchardgrass, and whiteclover produce high yields of forage if adequate amounts of lime and fertilizer are applied and the soil is otherwise well managed. (Capability unit IIe–1; woodland group 1.)

Dexter loam, 5 to 8 percent slopes, eroded (DeC2).—This soil has lost part of its original surface layer through erosion. The present surface layer is brown loam that is 6 to 8 inches thick and is friable. In a few places the subsoil is exposed.

Most areas of this soil were used for crops at one time, but now a slightly larger acreage is is forest than is cultivated. The trees are hardwoods of high quality.

This soil is well suited to all of the crops commonly grown, but it is not suited to frequent tillage. A cropping system is needed in which a mixture of grasses and legumes is grown for more time than crops that are tilled. The grasses and legumes help to conserve the soil and to add organic matter. If fertilizer is added and the soil is otherwise well managed, yields are moderately high. (Capability unit IIIe-1; woodland group 1.)

Dexter loam, 8 to 12 percent slopes (DeD).—This soil has stronger slopes than Dexter loam, 2 to 5 percent slopes, eroded, and the thickness of the alluvial deposits is more variable.

In areas that are not eroded, the surface layer is dark grayish-brown, friable loam that is about 8 inches thick. The areas that are cultivated have a surface layer of brown, friable loam that is 6 inches thick.

Runoff is rapid on this soil. The hazard of erosion is high. Fertility is moderately low.

Most areas in trees have been cut over a number of times, and many of the areas have been pastured. A few scattered areas have hardwoods of high quality growing on them. The cleared areas are used principally for unimproved pastures, along with surrounding soils that have similar or steeper slopes.

This soil can be used for row crops occasionally. All of the crops commonly grown are suited. Pastures of good quality can be grown. (Capability unit IVe-1; woodland group 1.)

Dexter clay loam, 2 to 5 percent slopes, severely eroded (DcB3).—This soil has lost most of its original surface layer through erosion. The present plow layer is largely friable, reddish-brown clay loam or silty clay loam. Shallow gullies that cut into the subsoil are common.

Runoff is medium to rapid on this soil, and the moisture-supplying capacity is moderately low. The hazard of erosion is moderate. This soil is fairly easy to work, but it cannot be cultivated over so wide a range of moisture content as the less eroded Dexter soils.

This soil is well suited to cotton, corn, alfalfa, and all of the pasture plants commonly grown. Because of the severe erosion, yields are likely to be low. If large amounts of fertilizer are added, a mixture of grasses and legumes is included in the cropping system, and the soil is otherwise well managed, moderately high yields can be obtained. (Capability unit IIIe-1; woodland group 1.)

Dexter clay loam, 5 to 8 percent slopes, severely eroded (DcC3).—This soil has lost most of its original surface layer and, in many places, part of its subsoil through erosion. The present surface layer is reddish-brown clay loam. Shallow gullies are common.

The soil is fairly easy to work, but the content of moisture at which it can be worked without damaging the tilth is narrow. The fertility and moisture-supplying capacity are low. Runoff is rapid, and, as a result, the hazard of erosion is high.

This soil is suitable for only occasional cultivation. It responds well to fertilizer and other good management. Cotton, corn, small grains, and all of the pasture plants commonly grown make fair to good yields if large amounts of fertilizer are added. (Capability unit IVe-1; woodland group 1.)

Dexter clay loam, 8 to 12 percent slopes, severely eroded (DcD3).—This soil has lost most of its original surface layer through erosion. The present surface layer is friable clay loam. Shallow gullies are common. In several places there are gullies that occupy more than 15 percent of an area.

This soil is low in moisture-supplying capacity. Runoff is rapid, and the hazard of erosion is high.

Much of this soil is idle and supports a scattered growth of native vegetation. The rest is used for unimproved pastures.

This soil is difficult to keep from eroding, even though it has fairly good tilth. Row crops can be grown occasionally, but yields are only medium to low. The soil is well suited to tall fescue, orchardgrass, bermudagrass, and whiteclover, and to other pasture plants that are commonly grown. Yields are good if large amounts of fertilizer are applied and the soil is otherwise well managed. (Capability unit VIe-1; woodland group 1.)

Dulac Series

The Dulac series consists of moderately well drained soils that have a fragipan. These soils developed in a thin mantle of loess that is underlain by acid, coastal plain sandy clay. Much of the acreage is in the east-central part of the county, but areas are scattered throughout other parts of the county. The areas are small to fairly large. Slopes are dominantly 2 to 8 percent, but in a few places they are as much as 12 percent.

The surface layer, a light yellowish-brown, very friable silt loam, is 6 to 9 inches thick. The subsoil is yellowish-brown or strong-brown, friable to firm silty clay loam to a depth between 20 and 28 inches. The fragipan ranges from 6 to 24 inches in thickness and is mottled brown and gray silty clay loam that is firm and compact. Just below is variegated, acid sandy clay or clay.

These soils generally are adjacent to the Silerton soils, which are well drained and lack a fragipan. On the steep side slopes below the Dulac soils are the Shubuta, Magnolia, and Ruston soils.

The Dulac soils are similar to the Freeland soils, which developed in old alluvium consisting of loess and coastal plain material. They are also similar to the Paden soils, which developed in a thin mantle of silt over old alluvium.

Dulac soils are strongly acid to very strongly acid. They are low in fertility and in organic matter. Permeability is moderately rapid in the upper 2 feet but slow below that depth. The response to fertilizer and other management is moderate.

Most areas were once covered with forests made up of hardwoods and shortleaf pines. A large acreage is now used for corn, cotton, hay, and pasture. Locally, the soils are important to agriculture.

Dulac silt loam, 2 to 5 percent slopes (DkB).—This moderately well drained soil is on broad ridgetops, chiefly in the east-central part of the county. The following describes a representative profile in a forested area:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable.

A_2 1 to 8 inches, light yellowish-brown (10YR 6/4) silt loam; weak, fine, granular structure; friable.

B_1 8 to 12 inches, yellowish-brown (10YR 5/4) or strong-brown (7.5YR 5/6) silt loam; moderate, fine, subangular blocky structure; friable.

B_2 12 to 24 inches, yellowish-brown (10YR 5/6) or strong-brown (7.5YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; friable to firm; a few fine mottles of light brownish gray (10YR 6/2) in the lower part; pale-brown or light yellowish-brown silt coating on peds; a few, small, brown concretions.

B_{3m} 24 to 42 inches, mottled yellowish-brown (10YR 5/4), light brownish-gray (10YR 6/2), and gray (10YR 5/1) silty clay loam; moderate, medium, angular blocky structure; firm; compact; few to common, small, brown concretions; a few gray streaks of clay and silt.

B_{2b} 42 to 54 inches +, variegated red (2.5YR 4/6), yellowish-brown (10YR 5/4), and light-gray (10YR 6/1) sandy clay; coarse, angular blocky structure to massive; firm or very firm; normally several feet thick.

In most places depth to the fragipan is between 20 and 28 inches. The fragipan contains much sandy or clayey material in places, especially in the lower part.

This soil is strongly acid to very strongly acid. It is low in natural fertility. Runoff is slow to medium. Internal drainage is medium above the fragipan but slow in the fragipan and below that depth. The surface layer and the upper part of the subsoil are permeable, but the fragipan is slowly permeable. The moisture-supplying capacity is moderately low. This soil is somewhat slow to warm in spring. It is easy to work. It is also easy to keep from eroding because the slopes are fairly smooth.

Most of the areas are in forest. The trees are chiefly mixed hardwoods, but some areas have a large proportion of shortleaf pine. A small acreage is used chiefly for crops that are cultivated.

Dulac silt loam, 2 to 5 percent slopes, is well suited to the row crops commonly grown and to pasture. Except for deep-rooted legumes, it is also well suited to most hay crops. Alfalfa makes good yields for 1 or 2 years, but the stand generally does not last long because there is too much water in the lower subsoil. Row crops can be grown in a short cropping system, but fertilizer is required for good yields. Moderately large amounts of lime and a complete fertilizer are needed, and the response is moderately high. (Capability unit IIe–2; woodland group 3.)

Dulac silt loam, 2 to 5 percent slopes, eroded (DkB2).—The surface layer of this soil generally is brown or light yellowish-brown, friable silt loam that is 6 inches thick. A few areas are severely eroded. In these places the surface layer consists mainly of material from the former subsoil. It is yellowish-brown silty clay loam.

This soil is low in natural fertility, but its response to fertilizer is moderate to moderately high. The soil is easy to work.

This soil is used chiefly for corn and cotton and for annual lespedeza grown for hay and pasture. It can be used frequently for crops that are tilled. Corn, cotton, and other row crops make fair to good yields. Small grains and most hay and pasture plants are suited, but alfalfa is not well suited. The stands of alfalfa do not last long, because of the slow drainage of the lower subsoil. (Capability unit IIe–2; woodland group 3.)

Dulac silt loam, 2 to 5 percent slopes, severely eroded (DkB3).—Because of erosion, this soil is shallower to the fragipan than Dulac silt loam, 2 to 5 percent slopes. The present surface layer, a yellowish-brown, friable silt loam, is largely material from the former subsoil.

In a few places the fragipan is exposed and there are a few gullies. In some places the surface layer is slightly clayey and the areas are cut by shallow gullies.

Dulac silt loam, 2 to 5 percent slopes, severely eroded, is harder to work and keep from eroding than the less eroded Dulac soils. Its natural fertility and moisture-supplying capacity are low. Response to fertilizer is moderately low.

This soil is poor for row crops, but it is fair to good for close-growing crops and for pasture. Row crops can be grown in a long cropping sequence, and yields are fair. Nevertheless, yields of small grains, of grasses and legumes for hay and pasture, and of other close-growing crops are better. Most of the hay and pasture plants commonly grown are suitable. Alfalfa does not grow well, as drainage in the lower subsoil is slow. (Capability unit IIIe–2; woodland group 3.)

Dulac silt loam, 5 to 8 percent slopes (DkC).—Except for having stronger slopes, this soil is similar to Dulac silt loam, 2 to 5 percent slopes. In areas that are cultivated, the plow layer is brown, friable silt loam that is 6 inches thick. In a few small areas, silty clay loam material from the subsoil is exposed. Slopes are as much as 12 percent in a small acreage.

This soil is low in natural fertility. Its response to fertilizer and to other management is moderate to moderately high. The soil is easy to work, but if it is cultivated frequently, it erodes rapidly.

Most of the acreage is in forests of cutover hardwoods and pines. Areas that have been cleared are used for cotton, corn, and pasture. Only a small acreage is idle.

This soil is suited to corn, cotton, and small grains. Nearly all hay and pasture plants can be grown, but alfalfa does not grow well, because of the slow drainage of the lower subsoil. Moderately large amounts of fertilizer are required for good yields of all crops. (Capability unit IIIe–2; woodland group 3.)

Dulac silt loam, 5 to 8 percent slopes, severely eroded (DkC3).—The surface layer of this soil is largely material from the former subsoil. It is yellowish-brown silt loam that is friable. In a few places the fragipan is exposed and there are a few gullies. Slopes are as much as 12 percent in a few areas.

This soil is low in fertility and in moisture-supplying capacity. Runoff is rapid. The fragipan is near the surface, and the hazard of erosion is high. Response to fertilizer is moderate to moderately low.

Most of this soil is idle or is used for unimproved pasture. A small acreage is used for crops, mainly cotton, corn, and annual lespedeza.

This soil is suited to only occasional use for row crops, and, even then, yields are low. This soil is fair to good for close-growing crops, hay, and pasture plants if it is properly seeded, fertilized, and managed. (Capability unit IVe–3; woodland group 3.)

Dunning Series

The Dunning series is made up of nearly level soils that are poorly drained to very poorly drained. These soils

are on bottom lands. They consist of recent alluvium that was washed from fine-textured soils of the uplands that developed chiefly in material weathered from limestone. The alluvium is fine textured and is slightly acid. Most of the acreage is along Indian and Hardin Creeks and their tributaries.

The surface layer of these soils is very dark gray, very dark grayish-brown, or black silty clay loam that is 10 to 18 inches thick. The layers below are highly mottled, and the dominant colors are dark gray to gray or light brownish gray. The texture ranges from silty clay loam in the uppermost part of these layers to silty clay or clay in the lower part.

These soils are similar to the Egam and Lindside soils, but they are darker colored and are more poorly drained. They are darker colored, finer textured, and less acid than the Melvin and Lee soils and have slightly poorer drainage.

Only one soil of the series—Dunning silty clay loam—is mapped in this county.

Dunning silty clay loam (0 to 2 percent slopes) (Du).—This soil is in small areas, chiefly in slight depressions on the outer rim of flood plains. The following describes a representative profile in a cultivated area:

A_{11p} 0 to 6 inches, very dark gray (10YR 3/1) to black (10YR 2/1) silty clay loam; moderate, fine, granular structure; friable to firm; slightly sticky and plastic when wet.

A_{12} 6 to 18 inches, dark-gray (10YR 4/1) or very dark gray (10YR 3/1) to black (10YR 2/1) silty clay loam; a few fine mottles of light olive brown (2.5Y 5/4); moderate, fine, subangular blocky structure; friable to firm; sticky and plastic when wet.

C_{g1} 18 to 32 inches, dark-gray (10YR 4/1) or dark grayish-brown (2.5Y 4/2) silty clay; many fine mottles of light olive brown (2.5Y 5/4); massive; firm; sticky and plastic when wet; few to common, small, dark-brown to dark reddish-brown concretions.

C_{g2} 32 to 42 inches +, gray (10YR 6/1 to 5/1) or light brownish-gray (2.5Y 6/2) silty clay or clay; many light yellowish-brown (10YR 6/4) and light olive-brown (2.5Y 5/4) mottles; massive; firm; sticky and plastic when wet; few to common, small, dark-brown to black and dark reddish-brown concretions; 2 or more feet thick.

In a few areas the soil has a layer of overwash that consists of thin, friable silt loam. In these areas the soil is slightly better drained, is easier to work, and is more productive than this soil in areas that lack this overwash. These included areas generally occur within larger areas of Dunning silty clay loam.

Dunning silty clay loam is slightly acid to medium acid. It is generally high in fertility and organic matter. Runoff is slow or very slow, and internal drainage is very slow. The fluctuating water table is at or near the surface much of the year and restricts movement of air and growth of roots. Small depressed areas and seepage spots remain waterlogged most of the year. This soil is difficult to work because the surface layer is fine textured and sticky or plastic. It can be worked only within a narrow range of moisture content without damage to tilth.

Originally, the areas had a cover of mixed hardwoods that tolerated wetness. Now, most areas have been cleared and are used for crops and pasture.

Poor drainage and susceptibility to flooding limit the use of this soil. The soil is fairly well suited to corn, soybeans, and grain sorghum, and it is well suited to pasture and annual hay crops. Unless artificial drainage is provided, yields of crops that are tilled are uncertain and failures are common. (Capability unit IIIw-2; woodland group 8.)

Egam Series

The Egam series consists of moderately well drained to well drained soils on bottom lands. These soils consist of sediments that were washed mainly from soils on uplands that developed in materials from limestone. Slopes range from 0 to 2 percent, but the very short slopes or banks along streams, sloughs, and drainageways range up to 8 percent in places.

The surface layer, a dark-brown, friable silty clay loam, is 4 to 12 inches thick. The subsoil is very dark grayish-brown, firm, compact silty clay loam.

These soils occupy positions similar to those occupied by the Huntington, Lindside, and Melvin soils, which are also on bottom lands, and those of the Wolftever, Sequatchie, and Beason soils, which are on low stream terraces. Egam soils are finer textured than the Huntington soils but are not so well drained and have a firmer, more compact subsoil.

Only one soil of the series—Egam silty clay loam—is mapped in this county.

Egam silty clay loam (0 to 3 percent slopes) (Ea).—This moderately well drained to well drained soil is on bottom lands where it is likely to be flooded. The following describes a representative profile:

A_p 0 to 6 inches, dark-brown (10YR 3/3) silty clay loam; weak to moderate, fine, granular structure; friable; slightly sticky and plastic when wet.

C_1 6 to 20 inches, very dark grayish-brown (10YR 3/2) silty clay loam; a few dark-gray (10YR 4/1) and dark grayish-brown (10YR 4/2) mottles; weak, medium, subangular blocky structure; firm and compact; slightly sticky and plastic when wet.

C_2 20 to 32 inches, very dark grayish-brown (10YR 3/2) silty clay loam that is mottled with shades of gray; weak, medium, subangular blocky structure; firm and compact; sticky and plastic when wet.

C_3 32 to 48 inches +, dark grayish-brown (10YR 4/2), brown (10YR 4/3), or dark-brown (10YR 3/3) silty clay loam that is mottled with shades of gray; firm, but less compact than the C_2 horizon and less sticky and plastic when wet.

This soil is medium acid to slightly acid. It is moderately high in organic matter and plant nutrients and moderately low in moisture-supplying capacity. Runoff is slow, and internal drainage is moderately slow. Permeability of the compact subsoil is moderate to slow. Because slopes are mild, the soil is easy to keep from eroding.

This soil is likely to puddle if it is plowed when too wet, and it then becomes hard and cloddy upon drying (fig. 6). If the soil is allowed to become dry before plowing, it breaks into clods. All areas are subject to flooding. A few areas are scoured by overflow waters.

The original mixed hardwoods have been cleared from practically all of this soil. Most of the acreage is used for row crops, pasture, and hay. Only a small acreage is idle.

Egam silty clay loam is well suited to corn, cotton, grain sorghum, soybeans, annual lespedeza, and a wide variety of perennial grasses and legumes. Alfalfa, red clover, orchardgrass, small grains that are seeded in fall, and cover crops are not commonly grown, because of flooding during the winter and early in spring. (Capability unit IIw-2; woodland group 4.)

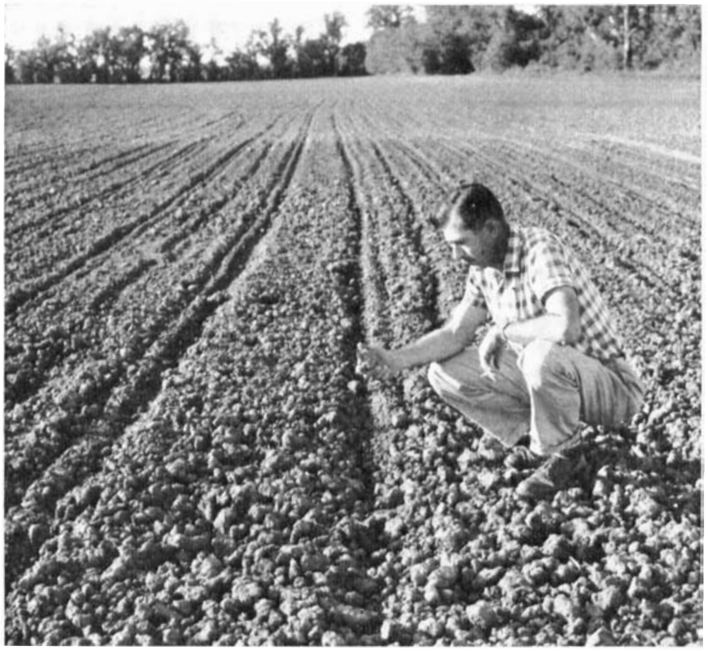

Figure 6.—**Egam silty clay loam is likely to make a cloddy seedbed if it is worked when it is too wet or too dry.**

Ennis Series

The Ennis series is made up of deep, well-drained soils on first bottoms. These nearly level soils consist of recent alluvium. The alluvium was washed mainly from soils on uplands that formed from cherty limestone. These soils lie in narrow strips along lateral drainageways. Slopes are 0 to 2 percent. The areas are principally on the flood plains of Hardin, Indian, and Horse Creeks and their tributaries.

The surface layer, a dark grayish-brown to brown silt loam, is 20 to 30 inches thick. It is underlain by brown or yellowish-brown silt loam that contains varying amounts of chert.

These soils are browner to a greater depth than the Lobelville and Lee soils and are better drained. They are lighter colored and more acid than the Huntington soils and generally are less productive. The Ennis soils occupy positions similar to those of the Vicksburg soils, which are also well drained, but they are not so sandy as those soils.

These soils are medium acid to strongly acid. Natural fertility is moderate. The deep root zone, very high moisture-supplying capacity, and favorable response to good management make these nearly level soils well suited to intensive use. In some places, however, their use is limited by flooding and by the chert in the soils.

Ennis silt loam (0 to 2 percent slopes) (Em).—This well-drained, moderately fertile soil is on flood plains. The following describes a representative profile:

A_p 0 to 10 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable.

C_1 10 to 30 inches, brown to dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable.

C_2 30 to 45 inches +, yellowish-brown (10YR 5/4) or brown (10YR 5/3 to 4/3) silt loam; common, fine mottles of gray (10YR 5/1) or grayish brown (10YR 5/2); few to many, small pebbles of chert; soil material is grayer, more poorly drained, and generally more cherty with increasing depth; several feet thick.

The thickness of the alluvium ranges from 4 to 15 feet or more. The lower subsoil is predominantly stratified silt loam, but in places it consists of beds of chert that are interspersed with silt and sand. Small fragments or pebbles of chert are common.

In a few small areas the surface layer is fine sandy loam or cherty silt loam. These included areas occur within larger areas of Ennis silt loam.

Ennis silt loam is medium acid to strongly acid. It is moderately high in organic matter, in plant nutrients, and in moisture-supplying capacity. In places where beds of chert are fairly near the surface, the water supply is much lower than normal. Runoff is slow, and internal drainage is medium. Permeability is rapid to moderately rapid. The soil has good tilth. It is easy to work and conserve. In places the soil is subject to scouring by floodwaters and deposition of sandy and gravelly materials.

Originally, this soil had a cover of mixed hardwoods. Now, most of the acreage is used for crops and pasture. Corn is the main crop, but cotton, grain sorghum, soybeans, and truck crops are grown on small acreages.

Floods limit use in places, but otherwise this soil is well suited to row crops, pasture, and hay. This soil can be cultivated intensively and responds well to fertilizer. If lime and a complete fertilizer are added, yields are high. (Capability unit I-1; woodland group 4.)

Ennis silt loam, local alluvium (1 to 3 percent slopes) (En).—This soil consists of a mixture of young local alluvium and colluvium that washed or drifted from Bodine, Talbott, and associated soils. The soil is similar to Ennis silt loam, but it is somewhat more variable because of differences in thickness of the deposits and in source of the parent materials. The areas are small. They are along narrow, intermittent drainageways, at the base of slopes, and in slight depressions.

The surface layer is brown or dark grayish-brown, friable silt loam that is 6 to 15 inches thick. The upper subsoil to a depth between 24 and 30 inches is brown or yellowish-brown, friable silt loam. It is underlain by mottled yellowish-brown and gray, friable silt loam. In some places angular fragments of chert and waterworn gravel are distributed throughout the profile.

This soil can be cultivated intensively. It is well suited to pasture plants and to all of the crops commonly grown. Flooding is not a hazard in most places. The moisture-supplying capacity and the response to fertilizer is high. (Capability unit I-1; woodland group 4.)

Ennis cherty silt loam (0 to 2 percent slopes) (Ec).—This soil has more chert on the surface and throughout the profile than Ennis silt loam. Typically, the soil is near the headwaters of the smaller streams.

The surface layer, a brown or dark grayish-brown, friable cherty silt loam, is 8 to 15 inches thick. Just below is brown or yellowish-brown, friable cherty silt loam that grades to beds of chert or stratified chert, silt, and sand. The chert consists of angular fragments and waterworn gravel that range from ½ to 3 inches in diameter.

Because of the chert, this soil has moderately low moisture-supplying capacity and medium to rapid internal drainage. In many places not enough moisture is held in the soil for plants to grow well, especially in dry periods. Natural fertility is moderate, and the response to fertilizer is moderately high.

The soil is used and managed about the same as Ennis silt loam, but yields are lower. Also, slightly more of this soil is in pasture.

This soil can be cultivated intensively. It is suited to all of the crops commonly grown. The chert makes the soil more droughty than Ennis silt loam, and it is not so productive as that soil. In some areas flooding is a problem, and, here, summer annual crops are better suited than other kinds of crops. (Capability unit IIs–1; woodland group 4.)

Ennis cherty silt loam, local alluvium (0 to 2 percent slopes) (Ee).—This soil is more cherty than Ennis silt loam. It lies along narrow, intermittent drainageways and at the base of slopes instead of on flood plains.

This soil has fragments of chert on the surface and throughout the profile that interfere with tillage. The soil is open and porous. Water moves through it somewhat rapidly, and the moisture-supplying capacity is moderately low. Consequently, during the short, dry periods, plants are likely to be damaged by lack of water.

Because the soil occupies long, narrow areas along with steep and moderately steep soils, a large proportion of it is in trees. Generally, the use of the soil is determined by the size of the individual areas and the use of adjacent soils.

This soil can be cultivated intensively. It is well suited to the crops and pasture plants commonly grown. Because the soil is less susceptible to flooding than Ennis silt loam, crops, especially vegetables, can be planted earlier than on that soil. (Capability unit IIs–1; woodland group 4.)

Ennis fine sandy loam (0 to 2 percent slopes) (Ef).—This soil has a surface layer that is coarser in texture than that of Ennis silt loam, and it has more chert scattered throughout the profile.

The surface layer, a fine sandy loam, is 8 to 10 inches thick. The material just below is somewhat variable and contains strata of silt loam and fine sandy loam or loamy sand.

In places the underlying beds are fairly near the surface, but in other places they are deep. In a few widely scattered areas the surface layer is loamy fine sand. In most places there are recent deposits of sand or of chert fragments.

Ennis fine sandy loam is medium acid to strongly acid. It is moderate in organic matter, in plant nutrients, and in fertility. Runoff is slow, and internal drainage is medium to rapid. The moisture-supplying capacity is lower in this soil than in Ennis silt loam. This soil is easy to work and to keep from eroding. In places the use of the soil is limited by flooding and deposition of sandy or cherty material that is unsuitable for agriculture.

Practically all of the acreage of Ennis fine sandy loam is in crops. The soil is suited to all of the crops commonly grown, and it can be used intensively for row crops. It responds well if fertilizer is added and other good management is used. (Capability unit I–1; woodland group 4.)

Etowah Series

The Etowah series is made up of deep, well-drained soils that are gravelly. These soils are on high stream terraces, where they developed in old alluvium. The alluvium was washed from soils on uplands that formed in material, mainly from limestone but that contained small amounts of material from sandstone and shale. The areas are small to medium in size and are not easily accessible. They are principally along the smaller streams in the eastern part of the county. Slopes are 5 to 12 percent.

All areas of these soils are severely eroded. The surface layer is brown to strong-brown gravelly silty clay loam. The subsoil is yellowish-red gravelly silty clay loam.

These soils are near the Pickwick and Paden soils, which are also on terraces. They are browner and slightly firmer than the Pickwick soils and lack the capping of loess that is typical of those soils. They are similar to the Paden soils, but they do not have a fragipan.

The Etowah soils are medium acid to strongly acid. They are moderately low in fertility. The moisture-supplying capacity is generally moderately low, but it varies with slope and erosion. Runoff is medium to rapid. Permeability is rapid in the surface layer and moderately rapid in the subsoil.

Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded (EtC3).—This deep, well-drained soil is on terraces. The following describes a representative profile:

A_p 0 to 5 inches, brown (7.5YR 5/4) to strong-brown (7.5YR 5/6) gravelly silty clay loam; weak, fine, granular structure; friable.

B_1 5 to 14 inches, strong-brown (7.5YR 5/8) gravelly silty clay loam; weak, fine, subangular blocky structure; friable.

B_2 14 to 26 inches, yellowish-red (5YR 4/6) gravelly silty clay loam; medium, subangular blocky structure; friable; a few, fine variegations of reddish brown or dark red.

B_3 26 to 34 inches, yellowish-red (5YR 5/6 to 4/6) gravelly silty clay loam; common, fine variegations of reddish brown and strong brown; friable to firm.

C 34 to 42 inches +, variegated yellowish-red (5YR 4/6), yellowish-brown (10YR 5/6), and red (2.5YR 4/6), firm gravelly silty clay loam; weak, medium, angular blocky structure; dark-red clay films on vertical faces of peds.

In small areas where the soil is not severely eroded, a part of the original surface layer, a brown silt loam, is at the surface. Depth to the limestone bedrock is between 10 and 20 feet. In a few places slopes range from 2 to 5 percent.

Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded, is medium acid to strongly acid. It is low in fertility and in moisture-supplying capacity. Runoff is medium to rapid.

About half of the acreage of this soil is used for corn, cotton, or annual lespedeza grown for hay. Areas that are no longer used for crops are reverting to forests of pine, cedar, or hardwoods.

Strong slopes, severe erosion, and the large amount of gravel in the soil limit its use. It is best to keep this soil in a sod of grasses and legumes most of the time and to grow a row crop only occasionally. All of the crops and pasture plants common to the county can be grown. Lime and a complete fertilizer are required for good yields. (Capability unit IIIe–1; woodland group 2.)

Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded (EtD3).—The surface layer of this soil consists mainly of material from the former subsoil. It is a reddish-brown or yellowish-red, friable to firm gravelly silty clay loam.

In small areas erosion has been even more severe, and in these places the surface layer is very gravelly. In many areas there are a few gullies.

Practically all of this soil was formerly used for crops and pasture, but much of the acreage is now idle or is reverting to forest. A small acreage is used for pasture.

Because of low fertility, low moisture-supplying capacity, and poor tilth, the use of this soil is limited. Row crops can be grown occasionally, but large amounts of fertilizer are required and yields are only fair to moderate. Pastures make fair to good yields if the soil is well managed. Small grains and other plants that grow well in seasons when moisture is plentiful make better yields than other crops. (Capability unit IVe-1; woodland group 2.)

Falaya Series

The Falaya series consists of nearly level, somewhat poorly drained soils on bottom lands. These soils consist of a mixture of sediments washed from loess and from soils on uplands of the Coastal Plain. Much of the acreage is in the White Oak Creek watershed.

The surface layer, a brown or dark grayish-brown silt loam or loam, is 6 to 8 inches thick. The material below this depth is mottled and is predominantly gray at a depth of about 20 inches. In places the subsoil is stratified with layers of sand or silt.

These soils are near the Vicksburg, Collins, and Waverly soils. They are not so well drained as the Vicksburg and Collins soils, but they are better drained than the Waverly soils. They are similar to the Lobelville soils, which formed from cherty limestone materials.

The Falaya soils are medium acid to strongly acid. They are high in moisture-supplying capacity and moderate in fertility. These soils are easy to work, but much of the acreage is subject to occasional flooding. The flooding is mainly in winter and in spring. The somewhat poor drainage and susceptibility to flooding limit the use of the soils for crops.

Falaya silt loam (0 to 2 percent slopes) (Fm).—This somewhat poorly drained soil is on bottom lands. The following describes a representative profile:

- A_p 0 to 9 inches, brown (10YR 4/3 to 5/3) or dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure.
- C_{g1} 9 to 17 inches, grayish-brown (10YR 5/2 or 2.5Y 5/2) silt loam; many gray and yellow mottles; weak, fine and medium, granular structure.
- C_{g2} 17 to 38 inches, grayish-brown (2.5Y 5/2) to gray (5Y 5/1) silt loam; many reddish-brown and dark yellowish-brown mottles; weak, fine, granular structure to massive; friable.
- C_{g3} 38 to 50 inches +, mottled gray and brown silt loam; massive; friable.

In forested areas the soil is grayer than in areas that are tilled, and there are more mottles nearer the surface. The texture of the surface layer is mainly silt loam, but in small places the surface layer is loam or fine sandy loam. Depth to the C_{g1} layer ranges from 10 to 16 inches.

The soil is medium acid to strongly acid. Natural fertility is moderate. Runoff is slow. Permeability of the surface layer is rapid, but that of the subsoil is slow to moderately slow. This soil is subject to frequent overflow, especially in winter and spring. The water table fluctuates and is near the surface during part of the winter and spring. If the soil is not too wet, it is easy to work and tilth is good. The soil is responsive to fertilizer and good management.

Originally, this soil had a cover of hardwoods that tolerated wetness. Now, nearly all of the acreage is used for corn, soybeans, cotton, grain sorghum, and other row crops, and for hay and pasture.

Crop failures are fairly common on this soil in wet seasons. Yields can be improved if the areas are drained artificially, but flooding cannot be eliminated entirely. If the soil is drained, it can be cropped intensively, and yields are generally good. (Capability unit IIw-1; woodland group 8.)

Falaya loam, local alluvium (1 to 3 percent slopes) (Fa).—This soil is coarser textured than Falaya silt loam. It occupies small, narrow areas along intermittent drainageways and is also in depressions on uplands or at the base of slopes. The texture of the surface layer is dominantly loam, but it ranges from silt loam to fine sandy loam.

This soil is medium acid to strongly acid. Natural fertility is moderate. The soil is easier to drain than Falaya silt loam, and runoff is slightly more rapid. Also, this soil is not so likely to be flooded as that soil, nor does the water remain on the soil as long. Locally, seepage water from adjacent hills causes small areas to be waterlogged.

Falaya loam, local alluvium, is slightly better suited to crops than Falaya silt loam. The areas are small, however, and it is hard to make full use of them. The soil is well suited to soybeans and to hay and pasture plants that tolerate wetness. Corn, cotton, and other plants commonly grown make high yields if the soil is drained. If fertilizer is added and other good management is used, the soil responds well and is suitable for intensive use. (Capability unit IIw-1; woodland group 8.)

Freeland Series

The Freeland series consists of moderately well drained soils that have a fragipan at a depth of about 2 feet. These soils are on low terraces. They developed in alluvium made up of a mixture of loess and coastal plain sediments. The soils are chiefly in the western part of the county. Slopes range from about 2 to 8 percent.

The surface layer of these soils, a brown, very friable loam, is 6 to 10 inches thick. The subsoil is yellowish-brown, friable silty clay loam or clay loam. It is underlain by a compact, mottled layer at a depth of about 24 inches.

These soils are commonly next to the Dexter and Hatchie soils, which are also on low stream terraces, and next to the Collins, Falaya and Waverly soils, which are on bottom lands. They are not so well drained as the Dexter soils, but they are better drained than the Hatchie.

These soils are strongly acid. They are moderately low in fertility and in organic matter. They have medium to slow internal drainage. Permeability is moderately rapid in the surface layer but moderately slow in the subsoil. The moisture-supplying capacity is moderately low.

The natural vegetation of hardwoods has been cleared from most of the acreage. The areas are used mostly for corn, cotton, annual lespedeza, soybeans, and grain sorghum, but several acres are in pastures. The pastures consist of annual lespedeza, tall fescue, and whiteclover.

The slowly permeable fragipan restricts movement of

water through this soil. As a result, the soils warm slowly in spring and there is a shortage of water during dry periods. Root development is restricted to the uppermost 2 feet. These soils respond well if fertilizer is added and other good management is used. They are well suited to all of the crops commonly grown, except possibly alfalfa. Alfalfa does not last long because of periodic excess water in the lower subsoil.

Freeland loam, 2 to 5 percent slopes, eroded (FrB2).—This moderately well drained soil is on low terraces. The following describes a representative profile:

A_p 0 to 8 inches, brown to dark-brown (10YR 4/3) loam; weak, fine, granular structure; very friable.

B_1 8 to 12 inches, yellowish-brown (10YR 5/4) loam; weak, fine or medium, subangular blocky structure; very friable.

B_2 12 to 24 inches, yellowish-brown (10YR 5/4) clay loam or silty clay loam; moderate, fine and medium, subangular blocky structure; friable; commonly has a few, fine, faint mottles of light yellowish brown (10YR 6/4) and light brownish gray (10YR 6/2) and a few, black concretions in the lower part.

B_{3m1} 24 to 40 inches, yellowish-brown (10YR 5/4) silty clay loam mottled with shades of gray and brown; firm and compact; common, small, black concretions.

B_{3m2} 40 to 48 inches, mottled yellowish-brown (10YR 5/4), light-gray to gray (10YR 6/1), and strong-brown (7.5YR 5/6) silty clay loam or clay loam; moderate, coarse, angular blocky structure; firm and compact; seams or tongues of gray clay are common; a few to common, black concretions and a few small pebbles.

C 48 to 60 inches +, mottled strong-brown, yellowish-brown, and light brownish-gray silty clay loam, clay loam, or sandy clay loam; weak, coarse, angular blocky structure to massive; common black concretions and a few small pebbles.

In some places the texture of the surface layer is silt loam or fine sandy loam. The texture of the layers that lie below the surface layer is silt loam or loam in places. Depth to the fragipan ranges from 22 to 30 inches; the fragipan ranges from 4 to 30 inches in thickness. The C layer is several feet thick in most places.

Included are some soils that formed from local alluvium on benchlike areas. In a few places slopes are 0 to 2 percent.

Freeland loam, 2 to 5 percent slopes, eroded, is strongly acid. It is moderately low in fertility and in organic matter. Because the fragipan is at a depth of only about 24 inches and the capacity for storing water is low, the moisture-supplying capacity is moderately low. The soil has good tilth. It is easy to work and responds well to management.

This soil is suited to all of the crops commonly grown, except possibly alfalfa. Alfalfa probably would not last long, because of seasonal waterlogging of the subsoil. In places the soil is flooded occasionally for short periods. In these areas the use of the soil is likely to be limited to summer annual crops.

Freeland loam, 2 to 5 percent slopes, eroded, requires fairly large amounts of fertilizer if crops are to make satisfactory yields. The response is probably sufficient to justify adding the fertilizer. (Capability unit IIe–2; woodland group 3.)

Freeland loam, 2 to 5 percent slopes, severely eroded (FrB3).—Most of the original surface layer of this soil has been removed by erosion. The present plow layer consists largely of friable, yellowish-brown loam from the former subsoil. Depth to the fragipan varies, depending on the amount of erosion. The range is from a few inches to 20 inches.

Runoff is medium on this soil, and the moisture-supplying capacity is low. The hazard of erosion is moderate. Tilth is fair to good.

Most of the acreage is used for row crops or hay crops. A few acres are idle, and a few are in pasture.

This soil is suited to corn, cotton, lespedeza, and other crops commonly grown. It is not suited to frequent cultivation. Because of shallowness to the fragipan and low moisture-supplying capacity and fertility, yields are only moderate. If large amounts of fertilizer are applied, yields of pasture can be kept moderately high. (Capability unit IIIe–2; woodland group 3.)

Freeland loam, 5 to 8 percent slopes, eroded (FrC2).—This soil has stronger, shorter slopes than Freeland loam, 2 to 5 percent slopes, eroded. Otherwise, the two soils are similar. There are several acres that are not eroded. In a few places the slopes are as much as 20 percent.

This soil erodes rapidly when it is cultivated, but it can be used for row crops occasionally. It has good tilth, is easy to work, and responds moderately well to management. Because of the fragipan, the root zone is limited. The moisture-supplying capacity is moderately low, but it is sufficient to justify adding moderate amounts of fertilizer.

The soil is suited to all of the crops commonly grown, except possibly alfalfa. Alfalfa ordinarily does not last long, because of seasonal waterlogging of the subsoil. (Capability unit IIIe–2; woodland group 3.)

Freeland loam, 5 to 8 percent slopes, severely eroded (FrC3).—This soil is shallower to the fragipan than Freeland loam, 2 to 5 percent slopes, eroded. Nearly all of the original surface layer has been removed by erosion. The present surface layer, a friable, yellowish-brown loam or clay loam, is 4 to 6 inches thick.

In some places the fragipan is within a few inches of the surface, and in others it is at a depth of as much as 2 feet. There are a few gullies in some areas. In some places slopes are 8 to 12 percent.

Much of the acreage of this soil is used for unimproved pastures, but some areas are in cotton and corn.

This soil is suited to all of the row crops commonly grown, but a cropping system is required that provides a cover of grasses and legumes most of the time. Because of the low moisture-supplying capacity and the root zone being limited by the fragipan, close-growing crops probably would make better yields than row crops. Yields of row crops would also vary more from year to year because the supply of moisture is limited in summer. In most places the root zone is less than 2 feet thick and is waterlogged for short periods in wet seasons. Consequently, alfalfa and other deep-rooted legumes generally do not last long or make high yields. (Capability unit IVe–3; woodland group 3.)

Gravelly Alluvial Land

Gravelly alluvial land (Ga).—This miscellaneous land type is along streams and large, intermittent drainageways where it is subject to periodic overflow. It consists mainly of sand and gravel mixed with smaller amounts of silt and clay. The gravel consists largely of chert.

In a few places the materials have been deposited so recently that the areas support little or no vegetation. Many small areas are along channels where swiftly moving overflow water has removed the finer soil material. In other areas sand and gravel has been deposited by overwash. Most areas are cut by numerous overflow channels. Consequently, the surface is rough, and it changes with each overflow. Slopes are mostly 0 to 3 percent.

Gravelly alluvial land has little value for agriculture unless it is leveled and protected from overflow. Even then, many areas are too sandy and gravelly for pasture plants to grow. A few areas can be used for native pasture, but most areas are better suited to trees than to crops or pasture. (Capability unit VIIs-1; woodland group 9.)

Guin Series

The Guin series is made up of well-drained to excessively drained soils developed in material from beds of gravel and sand. These shallow soils occupy rough, hilly areas in the upper Coastal Plains. They consist almost entirely of gravel and sand. The materials are acid throughout.

In Hardin County the Guin soils are mapped only in a complex with soils of the Bodine series. A profile of a Guin soil in this complex is given under the Bodine series.

Gullied Land

Gullied land is made up of areas that have many deep and shallow gullies. Extensive land smoothing would be required to reclaim these areas for farming. Most of the acreage was formerly used for crops but now is idle. The gullies are in several kinds of soil.

Gullied land, clayey materials (Gc).—This land type consists mainly of areas of Shubuta, Cuthbert, Paden, Dulac, and Talbott soils but includes areas of the Boswell, Sumter, Silerton, and Colbert soils. The areas have been severely damaged by erosion. Slopes are dominantly about 5 to 30 percent.

In most places the former surface layer has been removed and gullies form a close network. The present surface layer varies in color, texture, and consistence. In places the soils formed from coastal plain and limestone materials and the surface layer is yellowish-red to dark-red sandy clay and clay that is very firm and plastic. In other places the soils have a fragipan and formed from a mixture of loess and alluvium. Here, the surface layer is yellowish-brown to brown silt loam and silty clay loam that is friable to firm.

All of this land type has been used for crops. Most of it is now idle and has a cover of various kinds of vegetation. Some areas have a fairly thick stand of trees that were seeded naturally or were planted; others have little vegetation.

This land type is not suited to crops or to pasture. It is best used for trees. The trees are difficult to establish because of poor tilth, low moisture-supplying capacity, rapid runoff, and susceptibility to further erosion. (Capability unit VIIe-1; woodland group 9.)

Gullied land, loamy materials (Gm).—This land type is on high stream terraces. It consists of areas of the well-drained Pickwick, Waynesboro, and Dexter soils that have been severely damaged by erosion. Slopes are dominantly 5 to 25 percent, but in some areas they are as much as 40 percent.

In most places the former surface layer has been removed, and gullies form a close network. The present surface layer is yellowish-red to dark-red silty clay loam to sandy clay loam.

Most areas have been cropped but are now idle. Many of the areas have a sparse growth of grasses, weeds, briers, and shrubs, and a few areas have been reforested. In places the areas support little or no vegetation. Except for some areas that have been reforested naturally or have been planted to pines, the present vegetation is not effective in preventing further erosion.

This land type is not suited to crops or to pasture. Trees are difficult to establish, but they grow better than on Gullied land, clayey materials, or Gullied land, sandy materials. The areas are better suited to pines than to hardwoods. (Capability unit VIIe-1; woodland group 9.)

Gullied land, sandy materials (Gs).—This land type consists of areas of coastal plain and old terrace soils, mainly Ruston and Magnolia and the Waynesboro very gravelly sandy loams. The areas have been severely damaged by erosion. There are many shallow and deep gullies. Slopes are dominantly 10 to 25 percent, but they range from about 5 to 45 percent.

In most places the present surface layer is sandy clay loam and gravelly and very gravelly clay loam, but the texture ranges from sand to very gravelly clay loam and very gravelly silty clay loam. The soil is dominantly yellowish red and red, but in many places it is strong brown to dark red.

Most of the areas were once cultivated but are now idle. The present vegetation varies widely from place to place. Some areas have been reforested by natural reseeding or by planting, and, here, erosion has been checked. Other areas have little or no cover of vegetation, and in these areas accelerated erosion continues. In places gullies are cutting into adjacent upland areas. As a result, the nearby areas at the base of slopes and on bottom lands are damaged by overwash of sandy and gravelly material.

This land type is not suited to crops or to pasture. Trees are difficult to establish, but pine trees grow better than hardwoods. (Capability unit VIIe-1; woodland group 9.)

Hatchie Series

The Hatchie series consists of somewhat poorly drained soils that have a fragipan. These soils are on low stream terraces. They developed in old alluvium made up of loess and sandy coastal plain sediments. The sediments were washed mainly from the Shubuta, Cuthbert, Silerton, and Ruston soils that are on uplands. The soils are nearly level to gently sloping, but slopes are dominantly 1 to 3 percent.

The surface layer is commonly dark grayish-brown loam. The subsoil is light yellowish-brown loam or clay loam. It overlies a compact, mottled fragipan at a depth of about 20 inches.

These soils occupy positions similar to those of the Freeland and Almo soils. The Freeland soils are moderately well drained, and the Almo are poorly drained. They are also near the Dexter soils, which are well drained. The Hatchie soils also occupy positions similar to those

of the Taft soils and are similar in drainage, but they are sandier than those soils.

Only one soil of the series—Hatchie loam—is mapped in this county.

Hatchie loam (1 to 3 percent slopes) (Ha).—This soil is on low stream terraces. The following describes a representative profile:

A_p 0 to 8 inches, dark grayish-brown (10YR 4/2) loam; weak, fine, granular structure; very friable.

B_1 8 to 12 inches, light yellowish-brown (10YR 6/4 or 2.5Y 6/4) loam; weak, fine, subangular blocky structure; friable.

B_2 12 to 20 inches, light yellowish-brown (2.5Y 6/4 or 10YR 6/4) loam or clay loam; common mottles of gray and brown; weak to moderate, medium, subangular blocky structure; friable to firm; a few dark-brown concretions.

B_{3m} 20 to 40 inches, mottled light yellowish-brown (2.5Y 6/4), light brownish-gray (10YR 6/2), and gray (10YR 6/1) silt loam; weak, medium, subangular blocky structure; firm and compact; a few very dark brown concretions.

C 40 to 60 inches +, mottled yellowish-brown (10YR 5/4), or light olive-brown (2.5Y 5/4), and gray (10YR 6/1) fine sandy loam, clay loam, or silty clay loam; friable; common dark-brown concretions and gray clay seams or tongues.

In a few places this soil has a thin cover of sediments deposited by overwash. In these places the surface layer is browner and thicker than that of the profile described.

Hatchie loam is strongly acid to very strongly acid. It is low in fertility. The fragipan is slowly permeable and restricts movement of water through the soil. Consequently, planting is delayed in spring and the supply of moisture available for plants is short during the dry summer months. During the wet months, particularly in winter and in spring, the water table is near the surface. As a result, root penetration is shallow. In places this soil is subject to flooding during winter and spring, but the length of flooding is generally short. Because of flooding, crop failures are common.

The native vegetation, hardwoods that tolerate wetness, has been cleared from most of this soil. The areas are now used for cotton, corn, lespedeza, and pasture.

The somewhat poor drainage, low natural fertility, and moderately low moisture-supplying capacity in summer limit the use of this soil. Suitable crops are annual lespedeza, grain sorghum, and soybeans. (Capability unit IIIw-1; woodland group 7.)

Humphreys Series

The Humphreys series consists of deep soils that are well drained. These soils developed in alluvium of moderate age. The alluvium was washed from soils on uplands that formed chiefly in material from cherty limestone but that includes small amounts of material from shale, sandstone, and loess. The soils are in the eastern part of the county on low terraces of streams that drain valleys underlain by limestone. The cherty areas are near the upper parts of the drainage system. Slopes are 2 to 5 percent.

The surface layer in most places is brown silt loam or cherty silt loam that is 6 to 8 inches thick. The subsoil is yellowish-brown silty clay loam or cherty silty clay loam.

These soils are next to the Captina and Taft soils, which are also on low terraces; the Ennis and Lobelville soils, which are on first bottoms; and the Landisburg and Minvale soils, which are on foot slopes and benches. The Humphreys soils are older than the Ennis, and their profile is better developed. They lack the distinct fragipan typical of the Landisburg, Captina, and Taft soils and are better drained than those soils. Also, they are browner and more fertile than the Landisburg soils.

The soils are medium acid to strongly acid. Fertility is moderate. Tilth is good, and root development is deep.

These soils are used for corn, cotton, soybeans, and annual lespedeza, but they are suited to all of the crops grown locally. The soils respond well if fertilizer is added and other good management is used. Locally they are important to agriculture.

Humphreys silt loam, 2 to 5 percent slopes, eroded (HmB2).—This well-drained soil is on low terraces. The following describes a representative profile:

A_p 0 to 8 inches, brown to dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable.

B_1 8 to 15 inches, yellowish-brown (10YR 5/4) silt loam or silty clay loam; weak, fine, subangular blocky structure; friable.

B_2 15 to 35 inches, yellowish-brown (10YR 5/4 to 5/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable; a few fine pebbles of chert; a few, fine mottles of light brownish gray (10YR 6/2) and of brown to dark brown (7.5YR 4/4).

C 35 to 45 inches +, yellowish-brown (10YR 5/6) silty clay loam or silt loam; common to many mottles of brown, strong brown, and yellowish red; the mottles become grayer and increase in number with increasing depth few to many pebbles of chert.

In places pebbles of chert are distributed throughout the profile, but in most places the chert occurs at a depth below 2 or 3 feet. In many places the substratum is stratified with chert, sand, or silt. In a few areas slopes are short and are as much as 8 percent; some of these areas are moderately eroded and severely eroded, but they are small and are of minor importance.

This soil is medium acid to strongly acid. It is moderate in organic matter and fertility. Its moisture-supplying capacity is high. The soil is permeable, and it is easy to work and keep in good tilth.

Areas of this soil are 4 to 6 acres in size. They are used principally for corn or cotton and for annual lespedeza grown for hay. The soil is suited to all of the crops commonly grown, including alfalfa. Crops on this soil respond well if fertilizer is added and the soil is otherwise well managed. (Capability unit IIe-1; woodland group 4.)

Humphreys cherty silt loam, 2 to 5 percent slopes, eroded (HcB2).—This soil has many fragments of chert on the surface and throughout the profile, but it is otherwise similar to Humphreys silt loam, 2 to 5 percent slopes, eroded.

This soil is medium acid to strongly acid. It is moderate in fertility. Except for the chert, the soil is easy to work and maintain. The chert also makes the soil slightly droughty, and, as a result, the supply of moisture is lower than for Humphreys silt loam, 2 to 5 percent slopes, eroded. The soil is in fairly low areas, however, and the droughtiness is somewhat offset by moisture received from higher areas.

This soil is suited to all of the crops commonly grown, and it can be used frequently for cultivated crops. If fertilizer is added and other good management is used, the response is moderately high. (Capability unit IIe-1; woodland group 4.)

Huntington Series

The Huntington series is made up of nearly level, well-drained soils on first bottoms. The soils consist of sediments washed largely from soils on uplands that formed in material from limestone. The sediments also include small amounts of material from sandstone, shale, and other materials. These soils occupy long, narrow strips on flood plains of the Tennessee River and on flood plains of some of the other large streams.

The surface layer, a dark-brown or very dark grayish-brown silt loam, is 20 inches thick. It is underlain by brown or dark-brown silt loam or silty clay loam that contains strata of fine sandy loam. In most places there are a few mottles at a depth below 30 inches.

These soils are adjacent to the Egam and Lindside soils. They are better drained than those soils, and their subsoil is more friable than that of the Egam soils. They are also near the Bruno soils, but they are not so sandy as those soils. Huntington soils are browner and less acid than the Ennis soils.

These soils are slightly acid to neutral. They are high in fertility. These soils are easy to work and are highly responsive. They can be used intensively, and all of the crops and pasture plants commonly grown are suited. Huntington soils are highly valued for agriculture.

Huntington silt loam (0 to 2 percent slopes) (Hu).—This well-drained soil is on bottom lands. The following describes a representative profile:

A_p 0 to 9 inches, very dark grayish-brown or dark-brown (10YR 3/2 or 3/3) silt loam; weak, fine, granular structure; very friable.

C_1 9 to 20 inches, dark-brown or very dark grayish-brown (10YR 3/3 or 3/2) silt loam; weak, fine, granular structure; friable.

C_2 20 to 32 inches, dark-brown (10YR 4/3 to 3/3) fine silt loam or coarse silty clay loam; weak to moderate, fine and medium, granular structure; friable; a few, fine, faint mottles of very dark grayish brown and grayish brown (10YR 3/2 and 5/2).

C_3 32 to 45 inches +, dark-brown to very dark grayish-brown (10YR 4/3 to 3/2) silt loam, silty clay loam, or fine sandy loam; weak, fine and medium, granular structure; friable; compacted in places; faintly mottled with shades of gray and brown.

This soil is generally free of mottles to a depth between 24 and 30 inches, and in some places it is free of mottles to a depth of several feet. The soil is generally free of gravel, but there are small patches of mollusk shells and Indian artifacts in places.

This soil is slightly acid to neutral. It is high in organic matter, plant nutrients, and moisture-supplying capacity. The permeability of the surface layer is rapid, and that of the subsoil is moderately rapid. Tilth is good, but the soil is subject to overflow in winter and early in spring.

Most of the acreage of this soil is used for corn, soybeans, and annual lespedeza. Yields are high.

The soil is well suited to intensive use for crops that are cultivated. It is highly productive of pasture, but it probably would be more profitable to use the areas for crops. Because of flooding in winter, summer annuals are crops that are commonly grown. (Capability unit I-1; woodland group 4.)

Huntington fine sandy loam (0 to 2 percent slopes) (Hn).—The surface layer of this soil is coarser textured than that of Huntington silt loam, and there is more sand in the lower part of the profile.

Nearly all of the acreage of this highly productive soil is used for corn and other summer annuals.

This soil is used and managed about the same as Huntington silt loam. Flooding in winter and early in spring somewhat restricts use of the soil for winter annuals and for perennial and biennial crops. Yields are not so high as on Huntington silt loam, mainly because of lower moisture-supplying capacity during critical dry periods. (Capability unit I-1; woodland group 4.)

Landisburg Series

The Landisburg series consists of moderately well drained soils that have a weak to strong fragipan. These soils developed in local alluvium and colluvium washed mostly from the Bodine soils, but the material also contains small amounts of sediments washed from shale, loess, and other materials. The soils are on benches, on fans, and at the base of upland slopes. The areas are scattered throughout the eastern part of the county in valleys underlain by cherty limestone. Slopes range from 5 to 20 percent.

In areas that are not eroded, the surface layer is grayish-brown or pale-brown cherty silt loam. The subsoil is yellowish-brown cherty silty clay loam. It overlies a compact fragipan at a depth between 20 and 28 inches.

Landisburg soils are similar to Minvale soils in position, age, and parent material, but they differ in having a fragipan, in being less well drained, and in being lighter colored.

The Landisburg soils are medium acid to strongly acid. They are moderately low in organic matter and fertility. Permeability of the surface layer is moderate to rapid, and that of the subsoil is moderate. Except for the chert, tilth is good in most places.

The native hardwoods have been cleared from less than half of the acreage of these soils. A few areas where slopes are mild are in cotton, corn, or vegetables, and many areas are in pasture. The pastures consist of native plants, annual lespedeza, or small bushes.

These soils are of small agricultural importance. The areas where slopes are mild are suitable for crops, but the steeper areas are best used for pasture or trees.

Landisburg cherty silt loam, 5 to 12 percent slopes, eroded (LaD2).—This moderately well drained soil has a fragipan at a depth of about 2 feet. The soil occurs mostly at the base of slopes below areas of Bodine soils. The areas are small to medium in size. The following describes a representative profile:

A_p 0 to 7 inches, grayish-brown (10YR 5/2) or pale-brown (10YR 6/3) cherty silt loam; weak, fine, granular structure; friable.

B_1 7 to 14 inches, yellowish-brown (10YR 5/4) fine cherty silt loam; weak, fine, subangular blocky structure; friable.

B_2 14 to 26 inches, yellowish-brown (10YR 5/4 to 5/6) or strong-brown (7.5YR 5/6) cherty silty clay loam; moderate, medium, subangular blocky structure; firm; contains a few, fine, faint variegations of light brownish gray, brown, and brownish yellow; friable.

B_{3m} 26 to 35 inches, yellowish-brown (10YR 5/6) cherty silty clay loam; common mottles of strong brown, light brownish gray, yellowish red, and pale brown; moderate, medium, angular blocky structure; compact; hard and brittle when dry, friable when moist; few to common, black concretions and stains.

C 35 to 64 inches +, yellowish-brown (10YR 5/6 to 5/4) cherty silty clay loam; many variegations of yellowish red, strong brown, gray, and light yellowish brown; weak, fine and medium, subangular blocky structure; firm.

The content of chert varies from place to place. In some places the surface layer is cherty and the subsurface and subsoil layers contain only a few fragments of chert or an occasional one. In other places the amount of chert increases with increasing depth. The fragments of chert are mostly less than 3 inches in diameter, but a few are as large as 6 to 8 inches in diameter. In forested areas the soil is darker because the content of organic matter is slightly greater.

This soil is very strongly acid. It is moderately low in fertility. The moisture-supplying capacity is low. Permeability is rapid in the surface layer and moderately slow in the subsoil. The soil has fair to good tilth, but the chert interferes somewhat with tillage.

About one-fourth of the acreage of this soil remains in hardwood forests. The cleared areas are used mainly for corn, cotton, and annual lespedeza.

This soil is fairly well suited to row crops, but it is well suited to small grains, to most hay crops, and to pasture. It is not suited to frequent cultivation, but if a long cropping system is used, fair yields of row crops can be obtained. Alfalfa is not well suited, because of slow drainage in the lower subsoil. The soil responds moderately well if fertilizer is added and other good management is used. (Capability unit IVe-3; woodland group 3.)

Landisburg cherty silt loam, 12 to 20 percent slopes (LaE).—Except that the solum is generally somewhat thinner, this soil is similar to Landisburg cherty silt loam, 5 to 12 percent slopes, eroded. Included with the soil in mapping is a small acreage of a soil that is free of chert.

Nearly all of Landisburg cherty silt loam, 12 to 20 percent slopes, is in forest. The soil is low in natural fertility and in moisture-supplying capacity.

This soil is poorly suited to crops that are tilled. If adequate amounts of fertilizer are applied and the soil is otherwise well managed, fair to good yields of pasture can be obtained. (Capability unit VIe-2; woodland group 3.)

Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded (LcD3).—Practically all of the original surface layer of this soil has been removed by erosion. The present surface layer is mostly material from the former upper subsoil. It is yellowish-brown or strong-brown cherty silty clay loam that is friable. Depth to the fragipan is 15 to 20 inches. In a few places the soil contains only a small amount of chert.

The areas of this soil are small. In some places the soil is farmed the same as adjacent soils on smoother areas. A fairly large acreage is idle or is used as unimproved pasture, and a small part is reverting to trees.

Because of low moisture-supplying capacity, chertiness, and strong slopes, this soil is poorly suited to crops that are tilled. Tall fescue, whiteclover, annual lespedeza, and other pasture plants are suited. Also suited are small grains and other crops that mature early. Yields are fair to good. Large amounts of fertilizer are required for good yields because the natural fertility of the soil is low. The response to fertilizer and management is moderate. (Capability unit VIe-2; woodland group 3.)

Lee Series

The Lee series consists of poorly drained, strongly acid soils on bottom lands. Their parent material is alluvium that has washed chiefly from soils formed on uplands, mainly in material from cherty limestone but containing smaller amounts of shale and loess. The soils occupy level to depressional areas on the narrow flood plains of streams that drain the eastern part of the county. Commonly, the areas are small and are on the outer edges of the flood plains. In many places the soils are in long, narrow strips near the base of the uplands, where they receive much seepage water.

The surface layer of these soils is dark grayish-brown silt loam. The subsoil is gray silt loam or silty clay loam.

These soils are lighter colored and more acid throughout than the Melvin soils, which formed in materials from chert-free limestone. They are similar to the Waverly soils, which formed from sediments made up of loess and coastal plain materials.

Most of the acreage of these soils is used for crops and pasture, but several areas are in trees. The soils are suited to tall fescue, alsike clover, soybeans, and other crops that tolerate wetness. They are suited to other crops only if artificially drained.

Lee silt loam (0 to 2 percent slopes) (Lm).—This poorly drained soil is on bottom lands. The following describes a representative profile:

A_p 0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; a few, fine, faint mottles of very dark brown (10YR 3/2) and grayish brown (10YR 5/2); weak, fine, granular structure; friable.

C_{1g} 6 to 26 inches, gray (10YR 5/1) or grayish-brown (2.5Y 5/2) silt loam; common to many, fine, distinct mottles of dark reddish brown (5YR 3/4) and brown (10YR 4/3); massive; friable; common, small, very dark brown segregations; a few fine pebbles of chert.

C_{2g} 26 to 42 inches, gray (10YR 5/1) silt loam or silty clay loam; common, fine, distinct mottles of dark reddish brown (5YR 3/4), brown to dark brown (10YR 4/3), and yellowish brown (10YR 5/4); massive; friable; a few, very dark brown segregations; a few small pebbles of chert.

C_{3g} 42 to 50 inches +, gray (N 5/0) silt loam or silty clay loam; common mottles of dark reddish brown or reddish brown; massive; friable; contains more chert than the C_{2g} layer.

In a few small areas there is a thin layer of overwash that ranges from grayish brown to dark brown in color. The texture of the C_{2g} and C_{3g} layers ranges from silty clay to fine sandy loam, but in most places silt loam and silty clay loam are dominant. The content of chert varies throughout the profile, but in most places there is very little chert.

Lee silt loam is strongly acid. It is moderate in fertility and in organic matter. Surface runoff and internal drainage are very slow. The soil is permeable, but, because the fluctuating water table remains at or near the surface much of the time, movement of air and development of plant roots is restricted. All areas are susceptible to flooding. The soil remains waterlogged during the wet seasons, and ponds form in the depressions. A few areas are marshy.

Much of the soil has been cleared, and areas that are artificially drained are used for corn and hay. Areas that have not been drained are used for unimproved pastures. Water-tolerant oaks, willows, or sweetgums grow in the forested areas.

Corn, grain sorghum, and soybeans grow well if the areas are drained adequately. Lime and a complete fertilizer will be needed for good yields. If the areas are not drained, yields of most crops are low, and in many places the crop is lost. The soil is well suited to tall fescue, redtop, whiteclover, and other pasture plants that tolerate wetness. Because much moisture is available, even during dry periods, pastures yield well and are well suited as a source of supplemental summer grazing. (Capability unit IIIw–2; woodland group 8.)

Lee cherty silt loam (0 to 2 percent slopes) (Le).—This soil is cherty but is otherwise similar to Lee silt loam. The chert ranges from ½ inch to as much as 4 inches in diameter and makes up 15 to 25 percent of the soil mass. Generally, the content of chert increases with increasing depth. The soil occupies small areas on the outer rim of flood plains along the larger streams, and in places along small streams it occupies the entire flood plain.

This soil is strongly acid. It is moderately low in fertility, and its response is fair to moderate if fertilizer is added and other good management is used. The chert hinders but does not prevent tillage.

This soil has more wooded areas than Lee silt loam. The cleared areas are used mainly for unimproved pastures. Yields of forage are not so high as on Lee silt loam.

If this soil is drained, corn can be grown and yields are fair to good. If the soil is not drained, it is best suited to tall fescue, white clover, alsike clover, soybeans, and other plants that tolerate wetness. The soil is well suited to supplemental summer grazing because of its favorable moisture-supplying capacity. (Capability unit IIIw–2; woodland group 8.)

Lindside Series

The Lindside series consists of moderately well drained soils on first bottoms. The soils are made up of sediments washed largely from uplands underlain by limestone. They occupy level to depressional, long, sloughlike areas. The areas occur throughout the flood plains of the Tennessee River and along tributary streams that flow through regions of the county that are underlain by limestone.

In most places the surface layer is brown to dark-brown, friable silt loam. It is mottled at a depth of about 16 inches and grades to grayish-brown or light brownish-gray silt loam to silty clay loam at a depth of about 24 inches.

These soils are near the Huntington, Egam, and Melvin soils, which are on bottoms, and the Wolftever and Beason soils, which are on low terraces. The Lindside soils are not so well drained as the Huntington soils and are grayer at a depth below 16 inches. They are browner, less acid, and more fertile than the Lobelville soils, which consist of material that has washed chiefly from uplands underlain by cherty limestone.

The Lindside soils are medium acid to neutral. They are high in fertility and in moisture-supplying capacity. Slopes are 0 to 2 percent. Most areas are flooded occasionally, mainly in winter and in spring.

These soils are very productive, and they are well suited to many crops. They can be used intensively for row crops, but are limited somewhat by flooding and slightly slow internal drainage.

Lindside silt loam (0 to 2 percent slopes) (Ln).—This moderately well drained soil is on first bottoms. The following describes a representative profile:

A_p 0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable.

C_1 8 to 16 inches, brown (10YR 4/3) silt loam; a few, fine, faint mottles of grayish brown (10YR 5/2) or dark grayish brown (10YR 4/2); weak, fine, granular structure; friable.

C_2 16 to 24 inches, brown (10YR 4/3) or dark grayish-brown (10YR 4/2) silt loam or coarse silty clay loam; few to common, fine, faint mottles of grayish brown (10YR 5/2) and dark brown (10YR 3/3); weak, fine and medium, granular structure; friable; a few small, dark-brown concretions.

C_{3g} 24 to 30 inches, grayish-brown (10YR 5/2) or light brownish-gray (10YR 6/2) fine silt loam or silty clay loam; common, fine, faint mottles of brown (10YR 4/3); weak, fine or medium, granular structure; friable.

C_{4g} 30 to 42 inches +, light brownish-gray (10YR 6/2) silt loam or silty clay loam; many, fine, distinct mottles of brown (7.5YR 4/4) and yellowish brown (10YR 5/4); massive; friable; common, small, black and very dark brown concretions.

This soil is medium acid to neutral. It is fairly high in fertility. The water table is near the surface in the wet spring months, but it is several feet below the surface in summer. Except for occasional flooding and excess water, the soil is easy to work and is highly responsive to good management. The moisture-supplying capacity is high.

About three-fourths of this soil is used principally for corn, soybeans, grain sorghum, hay, and pasture. Crops are occasionally lost or damaged as a result of flooding or heavy rains. In some years overflow from the Tennessee River prevents planting. In other years tillage is delayed by excess moisture.

This soil is highly productive, but its use for crops is limited by annual flooding and a fluctuating water table.

The soil can be used intensively, and it is well suited to all crops, except possibly alfalfa. Corn, grain sorghum, and other grain crops make high yields. The amount of flooding on individual farms largely determines if it will pay to grow cotton and hay crops. This soil is also highly productive of pasture. It responds well if fertilizer is added because it has a high moisture-supplying capacity. (Capability unit IIw–1; woodland group 4.)

Lindside silty clay loam (0 to 2 percent slopes) (Ls).—The surface layer is finer textured, but this soil is otherwise similar to Lindside silt loam. The surface layer is friable silty clay loam that is slightly sticky when wet. The subsoil ranges from silty clay loam to silty clay that is sticky and plastic when wet.

This soil is more closely associated with the Egam soils than with Lindside silt loam. Its tilth is not so good as that of Lindside silt loam, nor can it be worked over as wide a range of moisture content. The soil puddles if plowed when too wet and becomes hard and cloddy upon drying. It responds well to fertilizer and management.

Lindside silty clay loam is well suited to all crops, except possibly alfalfa. It can be used intensively for cultivated crops. Yields are moderately high. The soil is probably better suited to summer annual crops than to other crops because most areas are flooded in winter and spring and the water ponds on them. (Capability unit IIw–1; woodland group 4.)

Lobelville Series

The Lobelville series consists of moderately well drained to somewhat poorly drained soils on first bottoms. These nearly level soils are on the flood plains of Horse, Indian, and White Oak Creeks in valleys underlain by limestone. Slopes are 0 to 2 percent.

The surface layer is brown or dark grayish-brown, friable silt loam or cherty silt loam that is 8 inches thick. At a depth between 8 and 15 inches, there is a grayish-brown silt loam or cherty silt loam that has a few mottles. The gray colors increase with increasing depth.

These soils are near the well-drained Ennis soils and the poorly drained Lee soils, which are also on flood plains. On the low terraces are the well-drained Humphreys soils and the moderately well drained Captina soils. The Lobelville soils are similar to the Lindside soils but are lighter colored, more cherty, and more acid. They are also lower in organic matter and natural fertility.

The Lobelville soils are medium acid to strongly acid and are moderate in fertility. They have high moisture-supplying capacity and are subject to periodic overflow. Internal drainage is medium to slow. These soils are permeable, but excess moisture sometimes delays planting and tillage. The soils are predominantly silt loam, but in many places they are cherty silt loam.

The Lobelville soils are important to the agriculture of the county. The native hardwood forests have been cleared from most of the acreage, and the areas are now used for corn, cotton, hay, and pasture. The soils are suited to the crops commonly grown. They can be cultivated frequently and respond well if fertilizer and lime are added.

Lobelville silt loam (0 to 2 percent slopes) (Lv).—This somewhat poorly drained to moderately well drained soil is on first bottoms. The following describes a representative profile:

A_p 0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable.

C_1 8 to 15 inches, grayish-brown (10YR 5/2) silt loam; few to common, fine, faint mottles of brown (10YR 5/3) and light yellowish brown (10YR 6/4); weak, fine or medium, granular structure; friable.

C_{2g} 15 to 23 inches, light brownish-gray (10YR 6/2) or gray (10YR 6/1 to 5/1) silt loam; common, fine and medium, mottles of yellowish brown (10YR 5/4) and grayish brown (10YR 5/2); weak, fine or medium, granular structure; friable; few to common pebbles of chert and small, brown to black concretions.

C_{3g} 23 to 36 inches +, gray (10YR 6/1) or light brownish-gray (2.5YR 6/2) silt loam; common, medium mottles of yellowish brown (10YR 5/6) and light gray (10YR 7/1); weak, medium, granular structure to massive; common pebbles of chert and small, brown to black concretions.

Depth to mottling ranges from 12 to 20 inches. In many places there are beds of gravel at a depth between 18 and 36 inches.

This soil is medium acid to strongly acid. It is moderate in fertility. The soil is friable and is moderately permeable. It is subject to flooding, but the floods do not last long. Surface runoff is slow, and in places water is pocketed for long periods. Excess water frequently delays tillage. During wet periods the water table rises to within a few inches of the surface.

This soil is used chiefly for corn, but several areas are in annual lespedeza grown for hay or pasture.

Since this soil is nearly level and is not subject to erosion, it is suited to intensive use. Corn, soybeans, red clover, tall fescue, orchardgrass, and white clover grow well if enough fertilizer and lime are used. Alfalfa is not suited, because of the inadequate drainage. Good pastures can be maintained, even during the drier parts of the growing season, because of the high moisture supply. All of the common pasture plants grow well if enough fertilizer is used. (Capability unit IIw–1; woodland group 4.)

Lobelville cherty silt loam (0 to 2 percent slopes) (Lt).—This soil is cherty throughout the profile but is otherwise similar to Lobelville silt loam.

This soil is moderate in fertility. It is less productive than Lobelville silt loam and is harder to cultivate. The chert throughout the soil interferes with but does not prevent tillage. The response to fertilizer and other management is moderately high.

Areas of this soil lie farther upstream than the areas of Lobelville silt loam. About half of the acreage is in trees or is idle. Most of the areas that are tilled are used for corn or cotton.

This soil can be cultivated intensively, and it is suited to all of the crops grown locally. Alfalfa does not last long, because of the fairly slow internal drainage of the soil and its fluctuating water table. Also, some areas are flooded for short periods during the winter and spring. (Capability unit IIw–1; woodland group 4.)

Magnolia Series

The Magnolia series consists of well-drained soils on uplands. These soils developed in stratified beds of coastal plain sandy clay, sandy clay loam, and clay. The areas are small and consist of low, choppy hills that are dissected by many shallow, crooked drainageways. Slopes are from 5 to 25 percent.

In areas that are not severely eroded, the surface layer—mostly a yellowish-brown fine sandy loam—is 6 to 8 inches thick. It is underlain by red or dark-red sandy clay or sandy clay loam.

These soils are commonly adjacent to the Shubuta, Silerton, and Ruston soils. Their subsoil is redder, more friable, and sandier than that of the Shubuta soils, and it is also thicker. The material in which the Magnolia soils formed lacked the mantle of loess characteristic of the material in which the Silerton soils formed. The Magnolia soils are not so sandy as the Ruston soils.

Magnolia soils are strongly acid. They are low in fertility and in organic matter. If the soils are not severely eroded, they have good tilth and are easy to work. Most of the acreage is in cutover forests of mixed hardwoods and pines. Where the slopes are mild, the soils are suitable for crops and pastures; where they are steep, the soils are limited mainly to pastures and trees.

Magnolia fine sandy loam, 5 to 8 percent slopes (MaC).—This deep, well-drained soil is on uplands of the Coastal Plains. The following describes a representative profile:

A_1 0 to 1 inch, very dark grayish-brown to very dark gray (10YR 3/2 to 3/1) fine sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 8 inches, yellowish-brown or brown (10YR 5/4 or 5/3) fine sandy loam; weak, fine to medium, granular structure; very friable.

B_1 8 to 12 inches, reddish-brown or yellowish-red (5YR 4/4 or 4/6) clay loam; weak to moderate, fine and medium, subangular blocky structure; friable.

B_{21} 12 to 22 inches, dark-red (2.5YR 3/6) sandy clay or sandy clay loam; moderate to strong, medium, subangular blocky structure; firm; a few, fine variegations of pale brown (10YR 6/3); a few, small, dark-brown or black concretions.

B_{22} 22 to 34 inches, dark-red or red (2.5YR 3/6 or 4/6) sandy clay or sandy clay loam; moderate, medium, angular and subangular blocky structure; firm; a few, small, dark-brown or black concretions; a few fine variegations of yellowish brown; a few, small, rust-colored pebbles of sandstone.

B_3 34 to 40 inches, red or dark-red (2.5YR 4/6 or 3/6) or yellowish-red (5YR 4/6) sandy clay loam; common, fine variegations of strong brown (7.5YR 5/6) or yellowish brown (10YR 5/6); moderate, angular and subangular blocky structure; firm; compact; few to common, rust-colored plates and pebbles of sandstone.

C 40 to 50 inches +, red (2.5YR 4/6) or yellowish-red (5YR 4/6), stratified beds of sandy clay loam, sandy clay, and sand; variegated with yellowish brown, light brownish gray, and gray; a few thin lenses or layers of gray clay that become thicker with increasing depth; grades to unweathered, stratified coastal plain sand and clay.

In places where there are small quantities of silt, the surface layer is loam or silt loam. In a few places the surface layer is loamy fine sand. In a few areas the soils have slopes of 2 to 5 percent. Small areas are moderately eroded to severely eroded.

This soil is strongly acid and is low in organic matter. It has fair to good moisture-supplying capacity. The soil has good tilth and is easy to work, but it erodes readily when it is cultivated. Plant roots penetrate the soil fairly easily.

Many areas of this soil are on hilltops in fairly remote locations. Most of the soil is in trees; the cleared areas are in cotton, corn, or unimproved pastures.

This soil can be cultivated occasionally, and all crops commonly grown are suited. All of the pasture plants commonly grown are well suited. Moderately large amounts of fertilizer are necessary for good yields. If fertilizer is added and other good management is used, the response is good. Alfalfa is well suited because of the good drainage and thick root zone. Large amounts of fertilizer are required, however, for high yields and to maintain a good stand. (Capability unit IIIe-1; woodland group 5.)

Magnolia fine sandy loam, 8 to 12 percent slopes (MaD).—This soil has stronger slopes but is otherwise similar to Magnolia fine sandy loam, 5 to 8 percent slopes. It is on upper side slopes. The areas are small to medium in size.

This soil is strongly acid and is low in fertility. It is moderately low in moisture-supplying capacity. Except in the eroded areas, the soil has good tilth and is easy to work. Plant roots penetrate the soil fairly easily.

Except for a small acreage that is moderately eroded and severely eroded, the areas are mostly in trees. Cotton, corn, or other row crops are grown on only a small acreage.

This soil is better suited to small grains, grasses, legumes, and other close-growing crops than to crops that are tilled. The soil erodes readily if cultivated, and a row crop should be grown only occasionally. Fertilizer is required for good yields. The response is moderate to moderately high. If large amounts of fertilizer are applied, alfalfa makes good yields because drainage is good and the root zone is thick. (Capability unit IVe-1; woodland group 5.)

Magnolia fine sandy loam, 12 to 25 percent slopes (MaE).—This soil has stronger slopes and varies more in the thickness of the profile, but otherwise it is similar to Magnolia fine sandy loam, 5 to 8 percent slopes.

Most of the acreage of this soil has a cover of trees and is not eroded. Here, the surface layer is dark grayish-brown fine sandy loam. In places the soil is moderately eroded and severely eroded, and in these the surface layer is yellowish-brown to reddish-brown clay loam. The cleared areas are reverting to native trees, but a few areas are used for pastures.

This soil is poorly suited to row crops. It is suited to tall fescue, whiteclover, orchardgrass, annual lespedeza, bermudagrass, and all of the pasture plants commonly grown. Yields are fair to good. Fertilizer is required, and the response is good enough to justify using moderately large amounts. (Capability unit VIe-1; woodland group 5.)

Mantachie Series

The Mantachie series is made up of nearly level, somewhat poorly drained soils on bottom lands. These soils consist of sediments washed from soils on uplands that formed from loess and coastal plain materials. The soils are widely distributed throughout the county, but the largest acreage is in the White Oak Creek watershed. Much of the acreage is subject to occasional flooding, mainly in winter and in spring.

The surface layer, a brown or grayish-brown fine sandy loam, is 6 to 8 inches thick. The material below is mottled and is predominantly gray at a depth of about 20 inches. In places the subsoil is stratified with sandy and silty layers.

Mantachie soils are near the Vicksburg, Collins, Falaya, and Waverly soils, which are also on flood plains. They are not so well drained as the Vicksburg and Collins soils, but they are better drained than the Waverly soils. They are more sandy, but otherwise they are similar to the Falaya soils.

Only one soil of the series—Mantachie fine sandy loam—is mapped in this county.

Mantachie fine sandy loam (0 to 2 percent slopes) (Mc).—This somewhat poorly drained soil is on flood plains. The following describes a representative profile:

A_p 0 to 6 inches, brown (10YR 4/3 to 5/3) fine sandy loam; weak, fine, granular structure; very friable.

C_1 6 to 14 inches, grayish-brown (10YR 5/2) fine sandy loam; few to common mottles of light brownish gray (10YR 6/2); weak, fine, granular structure.

C_{2g} 14 to 22 inches, light brownish-gray (10YR 6/2) or gray (10YR 5/1) fine sandy loam or loam; common to many, fine, distinct mottles of yellowish brown (10YR 5/4) or light yellowish brown (10YR 6/4 or 2.5Y 6/4); weak, fine, granular structure; friable; few to common, small, brown or black concretions.

C_{3g} 22 to 36 inches +, gray (10YR 5/1) or light-gray (10YR 6/1 to 7/1) loam or coarse clay loam; common or many, fine, distinct mottles of yellowish brown (10YR 5/6) or light olive brown (2.5Y 5/4); massive; friable; common, small, strong-brown to black concretions.

In forested areas this soil is grayer than in cultivated areas and has more mottles nearer the surface. The texture of the surface layer is mainly fine sandy loam, but

there are small areas in which it is loam or silt loam. Depth to the C_{3g} (gray) layer ranges from 10 to 16 inches.

This soil is medium acid to strongly acid. Natural fertility is moderate. Runoff is slow. Permeability of the surface layer is rapid, but that of the subsoil is slow to moderately slow. This soil is subject to frequent overflow, especially during winter and spring. Consequently, the fluctuating water table is near the surface during part of the winter and spring. When not too wet, the soil is easy to work and has good tilth. It is very responsive to fertilizer and management.

Originally, the soil had a cover of hardwoods that tolerated wetness. Now, practically all of it is used for row crops, hay, and pasture. Corn, soybeans, cotton, and grain sorghum are the chief crops.

Crop failures are fairly common during wet seasons. Yields can be improved if the soil is artificially drained, but flooding cannot be entirely eliminated. If the soil is drained, it can be used intensively for many crops and will produce good yields. (Capability unit IIw-1; woodland group 8.)

Melvin Series

The Melvin series is made up of poorly drained soils on first bottoms. These soils consist of recent general alluvium derived mainly from limestone. The soils are mainly in nearly level to depressional areas along the Tennessee River and in slack-water areas along that river in the eastern part of the county.

The surface layer is dark grayish-brown silt loam. It overlies mottled gray and brown silt loam to silty clay loam.

These soils are browner, less acid, and more productive than the Lee soils, which also are poorly drained and on bottom lands. They are near the Newark, Lindside, Egam, and Huntington soils, which are also on flood plains, but they have poorer drainage than those soils.

In most places the soils are slightly acid and are moderately high in fertility. In places the water table is near the surface in winter and spring. Most areas are flooded occasionally. Poor drainage and the hazard of overflow are the main limitations.

In this county the Melvin soils are mapped only in an undifferentiated unit—Melvin and Newark silt loams.

Melvin and Newark silt loams (0 to 2 percent slopes) (Me).—This unit consists of Melvin and Newark silt loams that were not mapped separately because of the fairly small differences between them and the intermingling of the two soils. These nearly level soils are on flood plains. The Melvin is poorly drained, and the Newark is somewhat poorly drained. The soils consist of sediments washed mainly from soils on uplands that formed in material from limestone but that include small amounts of other materials.

The following describes a representative profile of a Melvin silt loam:

A_p 0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; a few, fine, faint mottles of grayish brown and brown; weak, fine, granular structure; friable.

C_{1g} 8 to 14 inches, gray (10YR 5/1) silt loam; a few to common mottles of brown to dark brown (10YR 4/3) and grayish brown (10YR 5/2); weak, fine, granular structure; friable; slightly sticky and plastic when wet.

C_{2g} 14 to 22 inches, gray (10YR 6/1) silty clay loam or silt loam that is mottled with brown to dark brown (10YR 4/3) and reddish brown (5YR 4/4); weak, fine, granular structure; friable to firm; slightly sticky and plastic when wet.

C_{3g} 22 to 42 inches, gray (10YR 6/1 to 5/1) silty clay loam mottled with reddish brown and brown; weak, fine, granular structure to massive; firm; sticky and plastic when wet; few to common, soft, black segregations.

C_{4g} 42 to 50 inches +, gray (2.5Y 5/0 or 7.5YR 5/0) silty clay loam; a few mottles of brown (10YR 4/3) or olive brown (2.5Y 4/4); massive; firm; sticky and plastic when wet; a few, soft, black segregations.

The following describes a representative profile of a Newark silt loam:

A_p 0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, fine, granular structure; very friable.

C_1 6 to 15 inches, grayish-brown (10YR 5/2) silt loam; common, fine, faint mottles of light brownish gray (10YR-6/2) and dark brown (10YR 3/3); friable.

C_{2g} 15 to 29 inches, light brownish-gray (10YR 6/2) silt loam; many, medium, distinct mottles of brown (7.5YR 4/4) and yellowish brown (10YR 5/4); massive; friable.

C_{3g} 29 to 48 inches +, light brownish-gray (2.5Y 6/2) silt loam; common, fine mottles of brown to dark brown (7.5YR 4/4) and yellowish brown (10YR 5/4 to 5/6); massive; friable; a few, soft, black concretions.

In places within areas of the Melvin and Newark silt loams there is a thin layer of overwash that consists of brown loam or fine sandy loam. Below the A_p horizon the material ranges from silty clay to stratified layers of sandy loam, loam, and silt loam.

Melvin and Newark silt loams are neutral to slightly acid. They are moderately high in plant nutrients and in organic matter.

These soils are used for corn, soybeans, and grain sorghum. The crops are planted late because of the poor drainage. Crop failures are common. Areas in pasture are generally seeded to tall fescue. The pastures yield well, even in long periods of dry weather.

Most areas of these soils are flooded occasionally, mainly in winter and in spring. The floodwaters remain on the areas from a few hours to several days. The water table is near the surface during the wet seasons. Artificial drainage would broaden the use of these soils and increase yields but would not eliminate flooding. If the soils were drained, corn and other summer annual crops could be grown and would make good yields. (Capability unit IIIw-2; woodland group 8.)

Minvale Series

The Minvale series consists of deep, well-drained soils on benches, fans, or foot slopes. These soils have developed in local alluvium that washed mainly from soils derived from cherty limestone but that also includes small amounts of material from loess, shale, and sandstone. Most of the material has washed or rolled from the Bodine soils. Slopes are mainly 5 to 15 percent but range from 5 to 25 percent.

In areas that are not severely eroded, the surface layer of these soils is brown cherty silt loam. The subsoil is yellowish-red cherty silty clay loam.

These soils are better drained than the Landisburg soils, and unlike those soils, lack a fragipan.

The Minvale soils are strongly acid. They are moderate to low in fertility. Permeability is rapid to moderate.

Except for the chert, the soils are easy to cultivate and maintain.

These soils are potentially productive of row crops, pasture, and trees, but most of the acreage is in remote areas among other soils that are poorly suited to agriculture. The areas are mostly in cutover hardwoods, mainly oaks and hickories.

Minvale cherty silt loam, 5 to 12 percent slopes (MhD).—This well-drained, deep soil is on smooth foot slopes and benches, mainly below areas of Bodine soils and areas of cherty Talbott soils. The following describes a representative profile:

A_p 0 to 6 inches, brown (10YR 5/3) cherty silt loam; weak, fine, granular structure; friable.

A_2 6 to 10 inches, yellowish-brown (10YR 5/4) cherty silt loam; weak to moderate, fine, angular blocky structure; friable.

B_1 10 to 14 inches, yellowish-red (5YR 5/6) or strong-brown (7.5YR 5/6) cherty silt loam; weak, fine, subangular blocky structure; friable.

B_2 14 to 32 inches, yellowish-red (5YR 4/6 to 5/6) cherty silty clay loam; moderate, fine and medium, subangular blocky structure; friable.

B_3 32 to 45 inches, variegated yellowish-red (5YR 4/6 to 5/6), yellowish-brown (10YR 5/4), and light yellowish-brown (10YR 6/4) cherty silty clay loam; moderate, medium, angular blocky structure; firm.

C 45 to 60 inches +, variegated yellowish-red (5YR 5/6 to 4/6) yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) cherty or very cherty silty clay loam; moderate, medium or coarse, angular blocky structure; firm; a few black segregations and stains.

In places the lower subsoil and substratum are slightly cemented cherty or very cherty silty clay loam. Old deposits made up of alluvium and colluvium rest on limestone, shale, or sandstone at a depth between 5 and 20 feet. The fragments of chert are mostly 1 to 4 inches in diameter. The upper 3 feet of the profile is free of chert in many places.

This soil is medium acid to strongly acid. Natural fertility is moderately low. The moisture-supplying capacity is moderately low to moderately high. Except for the chert, the soil is easy to work. It responds moderately well to fertilizer and management. Roots penetrate the soil easily, and the rooting zone is thick.

Practically all of the cleared areas are used for unimproved pastures. A few acres are in corn or cotton.

This soil is suited to all the row crops, hay crops, and pasture plants commonly grown. Large amounts of fertilizer are needed for good yields of all crops. (Capability unit IIIe–1; woodland group 2.)

Minvale cherty silt loam, 12 to 25 percent slopes (MhE).—Except for having stronger slopes, this soil is similar to Minvale cherty silt loam, 5 to 12 percent slopes.

In small areas the soil is moderately eroded and severely eroded. In a few places slopes are steeper than 25 percent.

The strong slopes, chert, and low fertility and moisture-supplying capacity make this soil more suitable for pasture or other permanent vegetation than for crops that are tilled. Tall fescue, orchardgrass, ryegrass, bermudagrass, whiteclover, annual lespedeza, and the other pasture plants commonly grown are suited. Good pastures can be established and maintained, but fairly large amounts of fertilizer are required. (Capability unit VIe–1; woodland group 2.)

Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded (MnD3).—Most of the original surface layer of this soil has been removed by erosion. The present surface layer is reddish cherty silty clay loam. In most places chert has accumulated on the surface and there are a few shallow gullies.

Only a few acres of this soil are in row crops. Pastures, mainly unimproved, occupy many acres. A large acreage is reverting to trees.

The low fertility, low moisture-supplying capacity, and poor tilth make this soil better for small grains, grasses, and legumes than for crops that are tilled. Row crops can be grown, however, if a long cropping system is used. Yields are fair to good. Moderately large amounts of lime and a complete fertilizer are needed, and the response to these is moderate. (Capability unit IVe–1; woodland group 2.)

Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded (MnE3).—The surface layer of this soil is mainly material from the former subsoil. It is reddish-brown or yellowish-brown cherty silty clay loam that is 3 to 5 inches thick. In a few places slopes are more than 25 percent.

This soil is used for unimproved pastures or has reverted to second-growth hardwoods.

Strong slopes, chert, low moisture-supplying capacity, and low fertility make it impractical to cultivate this soil. The soil is difficult to work and to keep from eroding. All pasture plants common to the area can be grown, but the more drought-resistant plants are the best suited. Yields of forage are fair to good. Large amounts of fertilizer are required, and the response to these applications is moderate. (Capability unit VIe–1; woodland group 2.)

Mountview Series

The Mountview series consists of well-drained soils on gently sloping to strongly sloping ridgetops. These soils developed in a thin layer of loess underlain by material weathered from cherty limestone. The areas are small to medium in size. They are widely distributed throughout the parts of the county that are underlain by cherty limestone.

In areas that are not eroded, the surface layer, a light yellowish-brown, friable silt loam, is 6 to 8 inches thick. The subsoil is strong-brown, friable silty clay loam to a depth between 12 and 20 inches. It rests on material weathered from cherty limestone.

These soils commonly lie next to the Bodine soils, which have steeper, more dissected slopes than the Mountview soils. In some places they are alongside the Brandon soils, which have similar surface and subsoil layers but overlie coastal plain gravel.

Mountview silt loam, 5 to 8 percent slopes (MoC).—This well-drained soil is on narrow ridgetops and upper side slopes. The following describes a profile in a forested area:

A_1 0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable.

A_2 2 to 8 inches, light yellowish-brown (10YR 6/4) silt loam; weak, fine, granular structure; very friable.

B_1 8 to 11 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine and medium, subangular blocky structure; friable.

B_2 11 to 24 inches, strong-brown (7.5YR 5/6) silty clay loam or silt loam; medium, angular and subangular blocky structure; friable.

B_3 24 to 27 inches, strong-brown (7.5YR 5/6) silty clay loam; a few, fine, faint variegations of brown, yellowish brown, or light yellowish brown; friable to firm; a few fragments of chert less than ½ inch in diameter.

C_1 27 to 44 inches +, variegated strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/4) silty clay loam; many fragments of chert ¼ to ½ inch in diameter.

The thickness of the mantle of loess ranges from 15 to 30 inches. The upper part of the subsoil ranges from light yellowish brown to strong brown. The lower part of the subsoil ranges from silt loam to silty clay loam and from yellowish brown to yellowish red. The surface layer is generally free of chert, but the subsoil has a few, fine fragments of chert in the upper part and common, fine to coarse fragments of chert in the lower part.

This soil is strongly acid and is low in fertility. It is permeable and is easily penetrated by plant roots. Tilth is good. The soil is easy to work and to maintain.

Most of the acreage of this soil is in trees, chiefly mixed hardwoods. Many small areas are in remote places among steep soils that are better suited to trees than to other uses.

This soil is well suited to hay and pasture. If it is well managed, it is fairly well suited to row crops. All of the crops common to the area can be grown. Large amounts of fertilizer are required, and the response to such applications is moderate. (Capability unit IIIe-1; woodland group 2.)

Needmore Series

The Needmore series is made up of moderately deep to deep soils that are well drained. These soils developed in material weathered from calcareous shale or shaly limestone. They are on benchlike areas or are on the lower parts of slopes.

In Hardin County the Needmore soils are mapped only in a complex with soils of the Dandridge series. A profile of a Needmore soil in this complex is given under the Dandridge series.

Newark Series

The Newark series is made up of somewhat poorly drained soils on first bottoms. These soils consist of recent alluvium that washed mainly from limestone but also includes small amounts of other materials. The soils are mainly in nearly level to depressional areas along the Tennessee River and in slack-water areas along that river in the eastern part of the county.

In Hardin County the Newark soils are mapped only in an undifferentiated unit with soils of the Melvin series. A profile of the Newark soil in this unit is described under the Melvin series.

Paden Series

The Paden series consists of moderately well drained soils that have a fragipan. These soils developed in a thin mantle of loess overlying old alluvium. They are on broad areas that cap low, irregular hills. The areas are mainly in the central and western parts of the county. Slopes range from 2 to 8 percent.

In areas that are not eroded, the surface layer is yellowish-brown silt loam. The subsoil, a yellowish-brown silty clay loam, overlies a compact, mottled layer at a depth of about 24 inches.

These soils are adjacent to Pickwick, Waynesboro, Taft, and Robertsville soils. They are not so well drained as the Pickwick soils, but they are better drained than the Taft and Robertsville. They are similar to the Dulac soils, which developed in loess overlying coastal plain sandy clay.

The Paden soils are strongly acid. They are moderately low in natural fertility and in organic matter. Permeability is moderate in the uppermost part of the profile, but the pan retards movement of water and penetration of most roots. These soils generally have good tilth. They are easy to work.

Originally, the areas were in hardwoods, but now about three-fourths of the acreage is used for cotton, corn, grain sorghum, hay, and pasture. The slow drainage of the lower subsoil and high hazard of erosion are the main limitations.

Paden silt loam, 2 to 5 percent slopes (PaB).—This moderately well drained soil developed in a thin mantle of loess overlying old alluvium. The following describes a representative profile:

A_1 0 to 1 inch, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; very friable.

A_2 1 to 9 inches, yellowish-brown (10YR 5/4) silt loam; weak to moderate, fine, granular structure; very friable.

B_1 9 to 12 inches, yellowish-brown (10YR 5/4) silt loam; weak to moderate, fine, subangular blocky structure; friable.

B_2 12 to 20 inches, yellowish-brown (10YR 5/4 to 5/6) silty clay loam; moderate, fine, subangular blocky structure; friable.

B_3 20 to 24 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, subangular blocky structure; friable; common, fine mottles of light brownish gray (10YR 6/4) and strong brown (7.5YR 5/6).

B_{3m1} 24 to 29 inches, yellowish-brown (10YR 5/4) silt loam; common, fine mottles of light brownish gray (10YR 6/2) and gray (10YR 6/1); weak, medium, subangular blocky structure; firm and compact; a few black concretions and segregations.

B_{3m2} 29 to 39 inches, mottled yellowish-brown (10YR 5/4), light brownish-gray (10YR 6/2), and gray (10YR 5/1) silty clay loam or silt loam; weak, medium, angular blocky structure to massive; firm, compact, and brittle; few to common, black or dark reddish-brown concretions and segregations; a few small pebbles of chert and quartz.

B_{3m3} 39 to 45 inches, mottled dark-red (2.5YR 3/6), gray (10YR 6/1), and yellowish-brown (10YR 5/4) silty clay loam; moderate, medium, angular blocky structure; firm and compact; a few black and dark reddish-brown concretions; contains slightly more pebbles than the B_{3m2} layer.

B_{2b} 45 to 56 inches +, yellowish-red (5YR 4/6) or dark-red (2.5YR 3/6) silty clay loam or clay loam; common mottles of strong brown, yellowish brown, and gray; strong, medium, subangular blocky structure; firm; few to common, small pebbles of chert and quartz.

In a few places the subsoil is strong brown. In some of the level or slightly depressed areas, the subsoil is faintly mottled at a depth of about 16 inches. Depth to the fragipan ranges from 20 to 30 inches; the texture of the fragipan ranges from silt loam to sandy clay loam. In places the fragipan is thin and weakly developed, and in some areas the fragipan developed in a gravelly substratum. The old alluvium underlying the fragipan ranges

from yellowish-brown, stratified clay or sandy clay to sand and gravel.

This soil is strongly acid. It is low in fertility. Permeability of the surface layer is moderate to moderately rapid, but that of the subsoil is moderate to slow. The soil is easy to work. It responds well to fertilizer and management.

Most of the acreage of this soil is in forests of cutover hardwoods. Areas that are cultivated are used mainly for cotton, corn, and annual lespedeza.

This soil is suited to all of the crops commonly grown, and it can be cultivated frequently. Alfalfa is not well suited, because of the slow drainage in the lower subsoil. It makes fair to good yields for about 2 years, and then the stand begins to thin. Fairly large amounts of fertilizer are required for good yields of crops and pasture (fig. 7). (Capability unit IIe–2; woodland group 3.)

Figure 7.—A pasture of ryegrass and whiteclover on Paden silt loam, 2 to 5 percent slopes.

Paden silt loam, 2 to 5 percent slopes, eroded (PaB2).—This soil has lost part of its original surface layer through erosion. The present surface layer, a yellowish-brown, friable silt loam, is 6 inches thick. In places where erosion has been severe, small areas of yellowish-brown silty clay loam are exposed.

This soil is strongly acid. It is low in fertility, but if fertilizer is applied, the response is moderate to moderately high. The soil is easy to work and to keep in good tilth.

Practically all of this soil is in cotton, corn, and annual lespedeza. Productivity is moderately low and has been impaired by continuous cropping.

This soil is suited to pasture and to nearly all the crops commonly grown. Short rotations can be used because of the mild slope. Alfalfa grows well for about 2 years, but then the stand begins to die out because of excess water in the lower subsoil. Large amounts of fertilizer are required for good yields. (Capability unit IIe–2; woodland group 3.)

Paden silt loam, 2 to 5 percent slopes, severely eroded (PaB3).—Much of the original surface layer of this soil has been removed through erosion. The present surface layer is a yellowish-brown, friable silt loam. It consists of material from the former subsoil that has been mixed with the remaining surface layer by plowing.

In most places the plow layer is entirely within the subsoil. Depth to the fragipan varies, depending upon the amount of erosion. In places the fragipan is at the surface.

This soil is low in fertility, but its response to fertilizer is moderate. The soil is fairly easy to work. Tilth is fair to good.

Large areas of this soil are idle. A moderate acreage is used for corn and cotton; many acres are in unimproved pastures, largely annual lespedeza.

Because of rapid runoff, shallow depth to the fragipan, and low moisture-supplying capacity, this soil can be cultivated only occasionally. It is probably better suited to small grains, hay and pasture plants, and other close-growing crops than to row crops. Alfalfa is not well suited, because the fragipan is at or near the surface. (Capability unit IIIe–2; woodland group 3.)

Paden silt loam, 5 to 8 percent slopes (PaC).—Most of this soil is in forests of cutover, mixed hardwoods. Only a few areas are in crops.

This soil is strongly acid. It is low in fertility. Runoff is medium to rapid, and the moisture-supplying capacity is moderately low. The hazard of erosion is moderately high. The soil has good tilth, and it is easy to work. Its response to fertilizer and management is moderate.

Corn, cotton, and other row crops make fair to good yields on this soil, but the soil is suitable for only occasional cultivation. Alfalfa lasts only a short time because of wetness in the lower subsoil. Small grains and orchardgrass, tall fescue, ryegrass, red clover, white clover, lespedeza, and other plants grown for hay and pasture are well suited. Large amounts of fertilizer are required for good yields of crops and pasture. (Capability unit IIIe–2; woodland group 3.)

Paden silt loam, 5 to 8 percent slopes, eroded (PaC2).—This moderately eroded soil, in most places, has a surface layer that consists of brown, friable silt loam. Generally, the plow layer is within the original surface layer, but subsoil is exposed in a few small areas. In a few places slopes are as much as 12 percent.

This soil is strongly acid and is low in fertility. Its response to fertilizer is moderate. The soil has good tilth, and it is easy to work.

The soil is used mainly for cotton, corn, annual lespedeza, and unimproved pasture. It can be used for crops that are tilled if a fairly long cropping system is used, or it can be used for pasture. Nearly all of the crops commonly grown are suited, but alfalfa does not make good yields after 2 or 3 years. The moisture supply is too low for good yields of corn and other late-maturing crops, but fair yields can be made. (Capability unit IIIe–2; woodland group 3.)

Paden silt loam, 5 to 8 percent slopes, severely eroded (PaC3).—The surface layer of this soil is largely material from the former subsoil. It is yellowish-brown silt loam that in some places is more nearly silty clay loam. In many places the fragipan is exposed. In a few places there are shallow and deep gullies. In about 200 acres slopes are as much as 12 percent.

This soil is low in fertility and in moisture-supplying capacity. Runoff is rapid, and the hazard of erosion is high. The response to fertilizer is moderate to moderately low.

Many areas of this soil are used for unimproved pasture consisting of native grasses and annual lespedeza. A large acreage is idle. The areas that are cultivated are used mainly for corn and cotton, but a few are used for hay.

This soil is better suited to small grains, hay, or pasture than to row crops. It can be used for row crops if a long cropping system is used. Row crops generally do not make high yields, because of the low supply of moisture in the soil and the poor tilth. Yields from hay and pasture plants other than alfalfa are fair to good. (Capability unit IVe-3; woodland group 3.)

Paden-gullied land complex (Pc).—This complex consists of areas that are eroded. The subsoil is at the surface in most places, and as much as 15 percent of the surface area is cut by gullies. The gullies are generally deep and are so close together they impede the use of farm machinery or make its use impractical. The areas between the gullies are mostly severely eroded, but in places there are remnants of the original surface layer. Slopes range from 5 to 12 percent. A typical area of Paden-gullied land complex is shown in figure 8.

Figure 8.—**Typical area of Paden-gullied land complex.**

This complex is poorly suited to crops; it is better suited to permanent pasture or to trees. Because of the numerous gullies, the cost of establishing good pastures is fairly high. Fairly large amounts of fertilizer are required, and the response is moderately low because of droughtiness. (Capability unit VIe-2; woodland group 3.)

Pickwick Series

The Pickwick series consists of well-drained soils on old, high stream terraces. These soils formed in a thin mantle of loess that overlies old stream alluvium. The loess is 20 to 30 inches thick. In most places the soils are on the caps and upper parts of hills. They lie 400 to 600 feet above, and adjacent to, the low terraces. The soils are distributed over much of the county. Slopes range from 2 to 25 percent, but in most places they are between 5 and 15 percent.

In areas that are not severely eroded, the surface layer of these soils is yellowish-brown to dark-brown silt loam. The subsoil is yellowish-red silty clay loam.

These soils are near the Etowah, Paden, Waynesboro, Taft, and Robertsville soils. They are better drained and are browner than the Paden soils and lack the fragipan that is typical of those soils. They are similar to the Waynesboro soils in color, but they contain more silt.

The Pickwick soils are strongly acid. They are moderately high in fertility and in organic matter. They are permeable and are friable throughout the profile. They respond well to management. In areas that are not severely eroded, tilth is good and the soils are easy to work.

These soils are suited to tilled crops (fig. 9) and to pasture and trees.

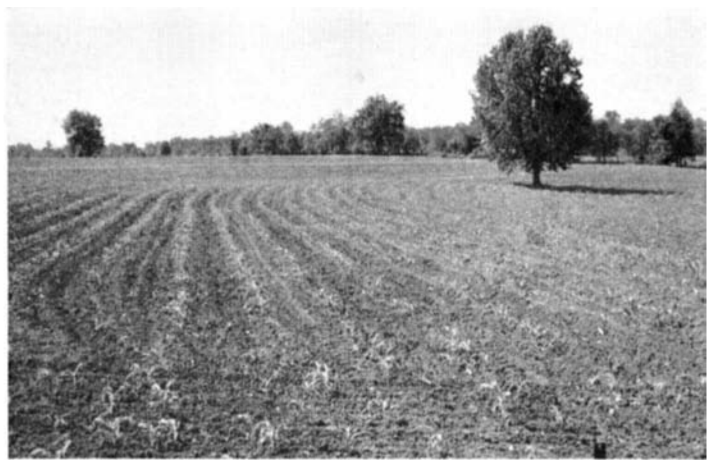

Figure 9.—**Corn planted on the contour on a Pickwick silt loam. If good management is used, the less sloping Pickwick soils are well suited to crops that are tilled.**

Pickwick silt loam, 2 to 5 percent slopes (PkB).—This well-drained, productive soil formed in a mantle of loess over old river alluvium. The following describes a representative profile:

A_1 0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular or crumb structure; very friable.

A_2 2 to 10 inches, yellowish-brown (10YR 5/4) to dark-brown (10YR 4/3) silt loam; moderate, fine, granular structure; friable.

B_1 10 to 13 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, fine, subangular blocky structure; friable.

B_2 13 to 25 inches, yellowish-red (5YR 4/6) or reddish-brown (5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; occasional to few small pebbles of chert and quartz; occasional, small, black concretions.

B_3 25 to 32 inches, yellowish-red (5YR 4/6 to 5/8) silty clay loam; common, fine variegations of brown to dark brown (7.5YR 4/4) or yellowish brown (10YR 5/4); moderate, medium, subangular blocky structure; friable to firm; a few small pebbles of chert and quartz; a few, small, black concretions.

B_{2b} 32 to 48 inches +, dark-red (2.5YR 3/6) or red (2.5YR 4/6) silty clay loam; common variegations of strong brown (7.5YR 5/6), yellowish brown (10YR 5/4), and light brownish gray (10YR 6/2); moderate or strong, medium, subangular and angular blocky structure; firm; a few gray silty clay loam seams from the B_3 layer; few to common pebbles of chert and quartz.

In most places the solum is 24 to 36 inches thick. The underlying alluvium is 3 to 20 feet thick. It ranges from sandy clay loam to silty clay in texture, but in most places it is silty clay loam. The content of gravel in the underlying material ranges from an occasional small piece to as much as 60 percent of the total volume. The gravel is mostly waterworn chert that is ½ inch to 3 inches in diameter. In a few places pebbles of quartz, mostly ½ inch to 1 inch in diameter, make up the bulk of the gravel.

Pickwick silt loam, 2 to 5 percent slopes, is strongly acid. It is moderately high in fertility and in moisture-supplying capacity. Surface runoff is medium, and the hazard of erosion is moderate. The soil has good tilth. It is easy to work and to keep from eroding. The response to fertilizer and other good management is high.

Areas of this soil are small to medium in size. They are chiefly in forests of mixed deciduous trees.

The soil is suited to all of the crops commonly grown in the county, including alfalfa and other deep-rooted legumes. Yields are good. A short cropping system can be used for crops that are cultivated. The response to fertilizer is good enough to justify adding large amounts. (Capability unit IIe-1; woodland group 1.)

Pickwick silt loam, 2 to 5 percent slopes, eroded (PkB2).—This soil has a thinner surface layer than Pickwick silt loam, 2 to 5 percent slopes. The surface layer is mainly dark-brown or yellowish-brown, friable silt loam that is 6 inches thick.

In places the soil is severely eroded. Here, material from the upper subsoil has been mixed with the remaining surface layer by plowing. In a few small areas, the plow layer consists entirely of material from the subsoil and is brown fine silt loam to yellowish-red silty clay loam.

Pickwick silt loam, 2 to 5 percent slopes, eroded, is moderately high in moisture-supplying capacity. It is highly responsive to fertilizer and to other good management. The soil has good tilth, and it is easy to work. It is fairly easy to keep from eroding because it is permeable and has mild slopes.

This soil is suited to all of the tilled crops commonly grown in the county, and a short cropping system can be used. It is also suited to all of the grasses and legumes commonly grown for hay and pasture. Fairly large amounts of fertilizer are required, but yields are good enough to justify adding large amounts of a complete fertilizer and lime. (Capability unit IIe-1; woodland group 1.)

Pickwick silt loam, 5 to 8 percent slopes (PkC).—This soil has a thinner profile than Pickwick silt loam, 2 to 5 percent slopes. The surface layer and subsoil vary more in thickness than corresponding layers in that soil, but they are generally less thick. Also, where this soil is on narrow ridgetops, it contains more gravel.

Most of Pickwick silt loam, 5 to 8 percent slopes, is in a forest of second-growth hardwoods.

The more serious hazard of erosion, greater runoff, and slightly lower moisture-supplying capacity make this soil less well suited to crops than Pickwick silt loam, 2 to 5 percent slopes. A cropping system is needed that does not require annual preparation of the seedbed. All of the crops common to the area are suited. (Capability unit IIIe-1; woodland group 1.)

Pickwick silt loam, 5 to 8 percent slopes, eroded (PkC2).—The surface layer of this soil is 4 to 6 inches thick. It generally is a brown or dark grayish-brown, friable silt loam. In small areas strong-brown silty clay loam is exposed.

The moisture-supplying capacity of this soil ranges from moderately low to moderately high. Because of the strong slopes, the hazard of erosion is high. The response to management is moderately high.

Much of this soil is used for cotton, corn, or hay; many areas are used for pasture.

This soil is fair for row crops, but it is good to very good for small grains, hay crops, and pasture. If fertilizer is applied according to the results indicated by soil tests, and if other good management is used, yields are medium to high. (Capability unit IIIe-1; woodland group 1.)

Pickwick silt loam, 8 to 12 percent slopes (PkD).—This soil has a thinner mantle of loess than Pickwick silt loam, 2 to 5 percent slopes, and depth to the old alluvium is about 15 to 20 inches. Also, more gravel is scattered throughout the profile. In a few places the soil is eroded and the surface layer is only 4 or 5 inches thick.

Pickwick silt loam, 8 to 12 percent slopes, has moderate moisture-supplying capacity. It has a thick, permeable root zone. Tilth is good.

Nearly all areas of this soil are in trees, and only a small part of the cleared acreage is in row crops.

This soil is not suited to frequent cultivation. All crops common to the area make good yields on this soil, but grasses and legumes are especially productive. Crops on this soil respond well if fertilizer is added and other good management is used. (Capability unit IVe-1; woodland group 1.)

Pickwick silt loam, 12 to 25 percent slopes (PkE).—This soil has thinner layers than Pickwick silt loam, 2 to 5 percent slopes. Also, there are more small areas where gravel is on the surface and the depth to the gravelly alluvium commonly is less. In places the depth to gravel is between 18 and 24 inches.

Plant roots penetrate this soil easily. Nevertheless, layers of gravel in many places limit depth of rooting to about the uppermost 18 to 24 inches. The moisture-supplying capacity is moderately low.

Most areas of this soil are in forest, but a few areas are used for pasture. This soil is suited to grasses and legumes grown for hay or pasture. Yields are good. The soil is too steep and too erodible to be suitable for row crops, even though good yields could be obtained in the wet seasons. (Capability unit VIe-1; woodland group 1.)

Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded (PwB3).—This soil has a thinner solum than Pickwick silt loam, 2 to 5 percent slopes, and its surface layer is finer textured. The surface layer is generally friable to firm, reddish-brown or yellowish-red silty clay loam. In places there are small areas of the original surface layer, a brown silt loam. There are a few shallow gullies in most places. In places a few small pebbles are on the surface and distributed throughout the soil.

Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded, is low in fertility and in organic matter. It responds well if fertilizer is added. The moisture-supplying capacity is moderately low.

A large acreage of this soil is used for corn, cotton, and hay; several acres are in improved pasture. The soil is suited to all of the crops commonly grown, but it ought not

be cultivated intensively. Yields are fair to good. (Capability unit IIIe–1; woodland group 1.)

Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded (PwC3).—The surface layer of this soil is thinner and finer textured than that of Pickwick silt loam, 2 to 5 percent slopes. There is also more gravel on the surface and throughout the profile. The surface layer, principally material from the former subsoil, is reddish-brown to yellowish-red, friable silty clay loam. Gullies are common.

Much of this soil is in unimproved pastures, but cotton, corn, and other row crops are grown in some places.

Because of poor tilth, low fertility, low moisture-supplying capacity, and rapid runoff, this soil is fair to poor for row crops. It is well suited to small grains and to legumes and grasses grown for hay or pasture. If fertilizer is added and other good management is used, its response is moderate. Close-growing crops make better response than row crops. (Capability unit IIIe–1; woodland group 1.)

Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded (PwD3).—This soil has a finer textured surface layer than Pickwick silt loam, 2 to 5 percent slopes. In most places the original surface layer has been removed through erosion.

The present surface layer is mainly material from the former subsoil that has been mixed with the remaining surface layer by plowing. In most places it is reddish-brown or yellowish-red silty clay loam that makes a striking color pattern when plowed. This layer is 6 inches thick.

There are a few pebbles on the surface and throughout the profile. In some places there are a few shallow gullies.

Low fertility, low moisture-supplying capacity, poor tilth, and susceptibility to further erosion limit the use of this soil. The soil is better suited to small grains, hay, or pasture than to row crops. Row crops make good yields in seasons when the weather is favorable, but in average seasons they make fairly low yields, and in dry seasons they make very low yields. Close-growing crops and crops that grow in spring and early in summer can be used with the least risk. (Capability unit IVe–1; woodland group 1.)

Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded (PwE3).—This soil has a finer textured surface layer than Pickwick silt loam, 2 to 5 percent slopes. The surface layer consists mainly of material from the former subsoil. It is reddish-brown or yellowish-red, friable silty clay loam. Gravel is common on the surface and throughout the solum. In places where erosion has been even more severe, there are small areas of gravelly and very gravelly soil material. There are a few shallow and deep gullies.

This soil is used principally for unimproved pasture; the areas not pastured are idle or are reverting to forests of mixed hardwoods.

Low moisture-supplying capacity, steep slopes, and the hazard of erosion limit the use of this soil. The soil is better suited to permanent pasture or forest than to row crops. Grasses and legumes respond well if fertilizer is added and other good management is used. Establishing a good stand of pasture plants is difficult in many places because of the poor tilth of the surface layer. After the plants are rooted, they grow well, especially if enough nitrogen is applied. (Capability unit VIe–1; woodland group 1.)

Pickwick-gullied land complex (Px).—This mapping unit consists of areas where erosion has removed all or most of the original surface layer. Shallow gullies are common, and in places they make up as much as 15 percent of the area. The present surface layer is mainly material from the former subsoil. It is reddish-brown or yellowish-red silty clay loam in most places.

In places there are a few deep gullies. Erosion is moderate to severe on the areas between the gullies, but it is predominantly severe. Slopes range between 5 and 20 percent.

The use of Pickwick-gullied land complex is limited by low fertility, low moisture-supplying capacity, poor tilth, and difficulty in preventing further erosion. Furthermore, the gullies are close enough and deep enough to make the use of farm machinery difficult. All of the pasture plants commonly grown in the county are suited. Yields are fair to medium. Because land smoothing is required before pastures can be established, the cost of establishing pastures is high. Yields are probably good enough to justify the cost. (Capacity unit VIe–1; woodland group 1.)

Robertsville Series

The Robertsville series is made up of poorly drained soils on low to moderately high stream terraces. These soils developed in alluvium made up chiefly of material from limestone. The native vegetation consisted of trees that tolerated water. Most areas are now in row crops or pasture.

The surface layer is grayish-brown, friable silt loam. The subsoil is mottled gray and brown, but predominantly gray, silty clay loam. It is underlain by a compact fragipan at a depth between 15 and 24 inches.

These soils occupy level or concave areas alongside the Beason and Wolftever soils, which are on low terraces, and the Taft soils, which are on high terraces. On the nearby bottom lands are the Melvin and Lindside soils. The Robertsville soils are grayer than the Taft soils and have poorer drainage.

Only one soil of the series—Robertsville silt loam—is mapped in Hardin County.

Robertsville silt loam (0 to 2 percent slopes) (RB).—This poorly drained soil is on low to moderately high stream terraces. The following describes a representative profile:

A_p 0 to 8 inches, grayish-brown (10YR 5/2) silt loam; weak to medium, fine, granular structure; friable.

B_{21g} 8 to 15 inches, light brownish-gray (2.5Y 6/2) silty clay loam; common mottles of dark grayish brown (2.5Y 4/2) and olive brown (2.5Y 4/4); weak to moderate, fine, subangular blocky structure; friable.

B_{22g} 15 to 22 inches, light brownish-gray (2.5Y 6/2) silty clay loam or silt loam; many, fine mottles of olive brown (2.5Y 4/4) or yellowish brown (10YR 5/4 to 5/6); firm and compact; common, small, black and brown concretions.

B_{23g} 22 to 30 inches, light-gray (2.5Y 7/2) or light brownish-gray (2.5Y 6/2) silty clay loam; many mottles of dark yellowish brown (10YR 4/4); firm and compact; common, black and brown concretions.

B_{24g} 30 to 46 inches, gray or light-gray (10YR 6/1) silty clay or silty clay loam; many mottles of yellowish brown (10YR 5/6) or olive brown (2.5Y 4/4); very firm and compact; sticky and plastic when wet; weak, coarse, angular blocky structure to massive; common, small, black concretions.

C_g 46 inches +, mottled light-gray (10YR 7/1), light brownish-gray (2.5Y 6/2), or reddish-brown to yellowish-red (5YR 4/4 to 4/6), and light olive-brown (2.5Y 5/4) silty clay; firm; massive when wet; few to common, small concretions.

In places the surface layer ranges from light brownish gray to dark grayish brown. There is a thin layer of overwash in places that is slightly browner than the material in the surface layer of the profile described. Depth to the fragipan ranges from about 15 to 24 inches. The fragipan varies greatly, and in places it is not strongly expressed. The solum, including the fragipan, ranges from about 30 to 60 inches in thickness. Areas in depressions on the higher stream terraces have a high content of silt and are generally lighter in color throughout than the soil in areas on low terraces of the Tennessee River. The soil is generally free of gravel, but in places there are a few pieces of gravel in the lower part of the profile.

Robertsville silt loam is very strongly acid, and it is low in fertility. The soil is fairly difficult to manage, and the response to management is generally low. Because the subsoil is dense or closely packed and there is little space between the pores for movement of water and air, the supply of moisture is erratic. The soil is wet in winter and spring but droughty in the drier summer and fall seasons. In some places the soil is in depressions where water is ponded for short periods. The soil is fairly easy to work, but it is slow to dry out and warm up in spring. Some areas are flooded occasionally.

This soil is too poorly drained for most crops commonly grown in the county. Yields are low, and failures are common. Using open ditches or bedding to remove excess surface water would broaden the use of the soil somewhat and would increase yields. Because of the compact subsoil, tile drainage is expensive and is not always effective.

This soil is fairly well suited to sorghum, soybeans, and other crops that can be planted late in spring. Lespedeza grows fairly well where surface drainage is fair. Pasture plants also grow fairly well, but the pastures cannot be grazed in winter and spring because of excess water. Tall fescue and whiteclover are well suited. If the soil is well fertilized, millet and sudangrass will make fair to good yields of forage for supplemental summer grazing. (Capability unit IVw–1; woodland group 7.)

Rock Land

Rock land (Rc).—This land type consists of areas where ledges and outcrops of bedrock occupy 25 percent or more of the surface. The outcrops are mostly limestone, but in some places there are outcrops of shale and sandstone. The land surface is rough. The areas are on lower ridge slopes, and they are widely distributed throughout the part of the county east of the Tennessee River.

Between the outcrops is fine-textured soil material that is a few inches to 3 feet thick. The surface layer in most places is thin, brownish silt loam to silty clay. It is underlain by red to mottled light olive-brown or olive silty clay or clay.

In places there are many ledges and short escarpments of almost solid bedrock. Slopes range from 12 percent to almost vertical where the bluffs rise along streams and drainageways. Loose chert, sandstone, and fragments of limestone are scattered over many areas. A few small areas consist chiefly of large, waterworn fragments of conglomerate.

Rock land is near the Talbott, Colbert, Bodine, Dandridge, Needmore, and Culleoka soils. The soil material is similar to that of the Talbott and Colbert soils.

Most of the acreage of this land type is in forest, but some areas consist of almost bare rock and support little or no vegetation. Dwarfed cedars or hardwoods grow on the less favorable sites, but vigorous hardwoods grow on the more favorable sites. The forests have been cut over many times. The present stands consist mostly of trees that are small or of poor quality. A few of the less steep areas are used for pasture.

Because of the large number of outcrops, the strong slopes, low moisture supply, and poor tilth, Rock land is not suited to row crops, and it is very poorly suited to pasture. The rock outcrops make tillage impractical. The areas are best used for trees. (Capability unit VIIs–1; woodland group 9.)

Ruston Series

The Ruston series consists of deep, well-drained soils on uplands. These soils developed in coastal plain materials made up of moderately coarse textured sandy clay loam in which there are thin strata of sand and sandy clay. These soils are on narrow ridgetops and on the steep side slopes of hills in many places throughout the county. Slopes range between 5 and 45 percent.

In areas that are not eroded the surface layer of these soils is pale-brown fine sandy loam that is about 8 inches thick. The subsoil is yellowish-red to red sandy clay loam. These soils lie next to areas of Shubuta, Cuthbert, and Waynesboro soils. They are sandier and more friable than the Shubuta soils, and they are deeper and sandier than the Cuthbert soils.

The Ruston soils are strongly acid to very strongly acid. They are low in fertility and low in moisture-supplying capacity. Permeability is very rapid in the surface layer and rapid in the subsoil. The hazard of erosion is high.

Most areas of these soils have a cover of cutover hardwoods and pines. Only a few areas are in crops, and several areas that were once in crops are now idle. The steep areas are poorly suited to crops, but where the slopes are mild, the soils are suited to most of the crops that are grown locally.

Ruston fine sandy loam, 5 to 8 percent slopes (RfC).—This deep, well-drained soil is on narrow ridgetops. The following describes a representative profile in a forested area:

A_1 0 to 1 inch, dark gray (10YR 4/1) or very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 10 inches, pale-brown (10YR 6/3) fine sandy loam; weak, fine, granular structure; very friable.

B_1 10 to 14 inches, yellowish-red (5YR 5/6) fine sandy loam or sandy clay loam; weak, fine, subangular blocky structure; friable.

B_2 14 to 28 inches, yellowish-red (5YR 4/6) sandy clay loam; weak to moderate, medium, subangular blocky structure; friable; a few variegations of red (2.5YR 4/6) and yellowish brown (10YR 5/4); a few small pebbles and black concretions.

B_3 28 to 34 inches, yellowish-red (5YR 5/6) or red (2.5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; few to common variegations of yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6); a few fragments of ironstone and pebbles that are mostly in pockets; a few black concretions.

C 34 to 60 inches +, yellowish-red (5YR 5/8) or strong-brown (7.5YR 5/6) fine sandy loam, loamy sand, or coarse sandy clay loam; a few, common variegations of reddish yellow, gray, and brown; single grained in some places and massive in others.

The subsoil ranges from strong brown to red, and from clay loam to sandy clay loam. In a few places the subsoil is dark red. In some places the upper 10 to 12 inches contains gravel that is apparently part of an old terrace. In small areas the surface layer and subsoil are loamy sand. In a few places slopes are 2 to 5 percent, and a few places are severely eroded. Sandstone fragments up to 12 inches in diameter are common in a few places.

Ruston fine sandy loam, 5 to 8 percent slopes, is very strongly acid. It is low in organic matter and in fertility. The moisture-supplying capacity is moderately low. Runoff is medium to rapid. Permeability is very rapid in the surface layer but rapid in the subsoil. The hazard of erosion is moderately high. Tilth is good.

Most areas of this soil are small and are in trees. The soil is suited to most of the crops grown locally, but it should not be cultivated intensively.

If a moderately long cropping system is used, row crops can be grown on this soil. The soil is well suited to small grains, hay crops, and pasture. Large amounts of fertilizer are required. The response to fertilizer and other good management is moderate. (Capability unit IIIe-1; woodland group 5.)

Ruston fine sandy loam, 8 to 12 percent slopes (RfD).—Except for stronger slopes, this soil is similar to Ruston fine sandy loam, 5 to 8 percent slopes. In areas that are cleared, the surface layer is thinner and there are gullies in a few places.

Most of the acreage of this soil is in trees. Of the few areas that have been cleared, the more eroded are reverting to native trees or have been planted to pine seedlings. A few areas are in unimproved pasture. The areas of this soil are small to medium in size, but they are distributed throughout the county.

The strong slopes, low fertility, low moisture-supplying capacity, and high hazard of erosion make this soil poorly suited to row crops. A row crop can be grown, however, if a cropping system is used that leaves the soil in sod crops most of the time. Any of the row crops commonly grown are suited. Small grains make fairly high yields because adequate moisture is available during the growing season. Alfalfa will grow well if it is heavily fertilized. Moderately large amounts of fertilizer are required for all other crops. The response to fertilizer and to other management is good. (Capability unit IVe-1; woodland group 5.)

Ruston fine sandy loam, 12 to 25 percent slopes (RfE).—Most areas of this soil are forested with mixed pines and hardwoods. In the few areas that are cleared, the soil is eroded and has a thin surface layer. Gravel and fragments of sandstone are on the surface in some places, and there are also shallow gullies.

The high hazard of erosion and low moisture-supplying capacity limit the use of this soil. The soil is probably best used for trees. Pasture plants that resist drought can be grown if moderately large amounts of fertilizer are added and the soil is otherwise well managed. Yields are generally fair but are likely to be low in summer. (Capability unit VIe-1; woodland group 5.)

Ruston fine sandy loam, 25 to 45 percent slopes (RfF).—This soil has stronger slopes and a shallower solum than Ruston fine sandy loam, 5 to 8 percent slopes. In some places the soil is gravelly, and in others it contains gravel and fragments of sandstone.

Most areas of this soil are in forests of mixed hardwoods and pines. The steep slopes, low fertility, and very low moisture-supplying capacity make this soil better suited to trees than to crops or pasture. (Capability unit VIIe-1; woodland group 5.)

Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded (RuD3).—The surface layer of this soil generally is a yellowish-red sandy clay loam that is 6 inches thick. It consists mostly of material from the former upper subsoil. There are shallow gullies in most places, and in a few places the gullies are deep.

The areas of this soil are small. Much of the acreage is reverting to forest.

Because of the strong slopes, severe hazard of erosion, and low moisture-supplying capacity, this soil is poorly suited to crops that are tilled. Yields of pasture are only fair, even if the soil is well managed. If fairly large amounts of fertilizer are added, however, profitable pastures can be established and maintained. Pasture plants that tolerate drought should be grown. The soil is well suited to trees, especially shortleaf and loblolly pines. (Capability unit VIe-1; woodland group 5.)

Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded (RuE3).—The surface layer of this soil generally is reddish-brown or yellowish-red sandy clay loam that is 4 to 6 inches thick. In places there are patches of the original, browner surface layer, and in most places there are a few gullies.

Most of the acreage of this soil is reverting to forests, but a small acreage is used as unimproved pasture.

Because of poor tilth, steep slopes, rapid runoff, and low moisture-supplying capacity, this soil is not suited to row crops or to pasture. Even bermudagrass and other plants that resist drought do not produce large amounts of forage. The soil is best used for pine trees. (Capability unit VIIe-1; woodland group 5.)

Saffell Series

The soils of the Saffell series are well drained to somewhat excessively drained. These soils developed in gravelly coastal plain material. They are on irregular hills, mostly on the points of ridges or the moderately steep side slopes. Most of the acreage is in the southeastern part of the county, but a few areas are scattered in other parts. Slopes range from 5 to 20 percent.

The surface layer of these soils, a yellowish-brown gravelly sandy loam, is about 7 inches thick. The subsoil is a yellowish-red gravelly clay loam to a depth between

18 and 24 inches. It overlies gravelly material or beds of gravel at a depth of about 30 inches.

These soils commonly lie adjacent to the Guin, Brandon, Ruston, and Shubuta soils. They most nearly resemble the Brandon soils but lack the capping of loess. They are not so deep as the Ruston and Shubuta soils and contain more gravel. They have a redder subsoil and less gravel than the Guin soils.

The Saffell soils are strongly acid. They are low in fertility and in organic matter. These soils are very droughty. They do not respond well to management, because of their coarse texture and low moisture-supplying capacity.

The Saffell soils are poor for agriculture. Most of the acreage is in forests of mixed hardwoods and pines. Areas that have been cleared are reverting to native forests or are used principally for unimproved pastures.

Saffell gravelly sandy loam, 5 to 12 percent slopes (SaD).—This is a well-drained to somewhat excessively drained soil. It is on points of ridges and on upper side slopes. The following describes a representative profile:

A_1 0 to 1 inch, dark-gray (10YR 4/1) gravelly sandy loam; weak, fine, granular structure; very friable.
A_2 1 to 7 inches, yellowish-brown (10YR 5/4) gravelly sandy loam; weak, fine, granular structure; very friable.
B_1 7 to 12 inches, yellowish-red (5YR 5/6) gravelly clay loam; moderate, fine, subangular blocky structure; friable.
B_2 12 to 24 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) gravelly clay loam; moderate, medium, subangular blocky structure; firm.
C 24 inches +, red to dark-red (2.5YR 4/6 to 3/6) very gravelly clay loam and sandy loam.

Beds of rounded and subrounded chert underlie the C layer. Depth to the chert gravel ranges from 1½ to 4 feet.

In some places there is a cap of loess and the surface layer is loam or silt loam in texture. The subsoil is silty clay loam in a few places.

Saffell gravelly sandy loam, 5 to 12 percent slopes, is low in fertility. It is droughty, and its response to management is poor. Runoff is medium, and internal drainage is rapid.

Only a small acreage of this soil is cleared, and it is used principally for unimproved pastures. The soil is best suited to permanent vegetation. If it is used for crops, small grains would probably be best suited. Pastures make fair to low yields, but large amounts of fertilizer are required. (Capability unit IVs-1; woodland group 9.)

Saffell gravelly sandy loam, 12 to 20 percent slopes (SaE).—Except for having stronger slopes, this soil is similar to Saffell gravelly sandy loam, 5 to 12 percent slopes.

Because of shallow depth over gravel and resulting droughtiness, this soil is best suited to trees. Pastures can be established, but large amounts of fertilizer are required and yields are low. (Capability unit VIIe-1; woodland group 9.)

Sequatchie Series

The Sequatchie series consists of deep, well-drained soils on low terraces. These soils developed in alluvium. The alluvium was weathered chiefly from sandstone but contains small amounts of material from limestone, shale, and other rocks. These soils are along the Tennessee River and its tributaries. Their relief is nearly level to sloping, but slopes are dominantly in the range of 2 to 5 percent.

The surface layer of these soils is dark-brown fine sandy loam. The subsoil is yellowish-brown to strong-brown clay loam. At a depth between 38 and 50 inches, it is underlain by faintly mottled, stratified silt and sand.

These soils are near the Wolftever and Beason soils, which are also on low terraces. On the adjacent first bottoms are the Huntington, Bruno, and Lindside soils. The Sequatchie soils are better drained and more friable than the Beason soils. They are coarser textured, better drained, and more friable than the Wolftever soils. Sequatchie soils are a little older than the Huntington soils, and their profile is somewhat better developed.

These soils are medium acid to strongly acid, and they are moderately high in fertility. They have high moisture-supplying capacity and a thick, permeable root zone. The soils are easy to keep in good tilth. They can be cultivated throughout a wide range of moisture content without injury to tilth or structure.

The Sequatchie soils are among the most productive in the county, and nearly all of their acreage is used for crops that are tilled.

Sequatchie fine sandy loam, 0 to 2 percent slopes (ScA).—This well-drained soil is on low stream terraces. The largest areas are between Savannah and Pickwick Landing Dam. The following describes a representative profile:

A_p 0 to 8 inches, dark-brown (10YR 4/3 to 3/3) fine sandy loam; weak, fine, granular structure; very friable.
B_1 8 to 18 inches, brown to dark-brown (10YR 4/3 or 7.5YR 4/4) fine sandy loam or sandy clay loam; weak, medium, granular or weak, fine, subangular blocky structure; friable.
B_2 18 to 38 inches, strong-brown (7.5YR 5/6) or yellowish-brown (10YR 5/4) clay loam; weak to moderate, fine and medium, subangular blocky structure; friable.
B_3 38 to 54 inches +, yellowish-brown (10YR 5/4) fine sandy loam or sandy clay loam; a few mottles of dark brown, light yellowish brown, and light brownish gray; weak, fine to medium, angular and subangular blocky structure; friable; few to common, fine pieces of gravel.

In small areas the surface layer is loam or silt loam. The texture of the subsoil is silty clay loam, sandy clay loam, or fine sandy loam.

This soil is medium acid to strongly acid. It is moderately high in natural fertility and high in moisture-supplying capacity. The soil is easy to work, is easily penetrated by roots, and is very responsive to good management. It is likely to be flooded during winter and early spring.

Sequatchie fine sandy loam, 0 to 2 percent slopes, can be used intensively, and practically all areas are in crops. Corn, small grains, soybeans, grain sorghum, and all other crops commonly grown are suitable. Yields are high if large amounts of fertilizer are added. Pastures also make high yields. Alfalfa is not well suited, because of the risk of flooding. (Capability unit I-1; woodland group 4.)

Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded (ScB2).—This soil has lost part of its original surface layer through erosion. The present surface layer, a friable, dark-brown fine sandy loam, is 4 to 6 inches thick.

Included with this soil in mapping are about 100 acres that have received recent sediments and have a thicker surface layer.

Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded, is medium acid to strongly acid. It is moderately high in fertility and in moisture-supplying capacity. It has good tilth and is easy to work. The soil responds well if fertilizer is added and other good management is used.

Most areas of this soil are used for crops that are cultivated, but some areas are used for small grains, hay, and pasture.

This soil is suited to corn, cotton, and all hay and pasture plants. Alfalfa grows well, but the stand is likely to be damaged by flooding in winter and spring. If this soil is well fertilized, crops can be grown in short rotations and will make high yields. (Capability unit IIe-1; woodland group 4.)

Sequatchie loam, 2 to 8 percent slopes, severely eroded (SeC3).—The surface layer of this soil is finer textured than that of Sequatchie fine sandy loam, 0 to 2 percent slopes. Much of the original surface layer has been removed by the scouring of floodwaters. The present surface layer, a strong-brown or yellowish-brown loam, is 4 to 6 inches thick. In a few places small pebbles have accumulated on the surface.

Sequatchie loam, 2 to 8 percent slopes, severely eroded, is moderately low in fertility and in moisture-supplying capacity. Runoff is medium, and the hazard of erosion is moderate. Tilth is fair to good. The response to fertilizer and other management is good.

This soil occupies narrow bands on side slopes or banks that adjoin areas of Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded. It requires a longer cropping system than that soil, but it is hard to use and manage the areas differently. All of the crops commonly grown are suitable. (Capability unit IIIe-1; woodland group 4.)

Shubuta Series

The Shubuta series consists of deep, well-drained soils on irregular, choppy hills. These soils developed in stratified beds of coastal plain sand and clay. They are mainly in the southern half of the county. The areas are small to large. Slopes range from about 5 to 45 percent.

The surface layer of these soils is yellowish-brown, friable fine sandy loam. The subsoil is yellowish-red or red sandy clay. It is underlain by stratified sandy clay that contains thin lenses of clay at a depth of about 40 inches.

In many places the Shubuta soils lie alongside the Cuthbert, Ruston, Magnolia, Boswell, Silerton, and Dulac soils. In most places they are on side slopes below those hilltops, capped mainly with loess, on which the Silerton and Dulac soils developed. The Shubuta soils have a much thicker subsoil than the Cuthbert soils, which formed in similar materials. They are not so sandy as the Ruston soils. Their subsoil is not so red as that of the Magnolia soils, and it is thinner and more compact.

The Shubuta soils are very strongly acid. They are low in fertility and in organic matter. These soils are fairly droughty. They erode readily, and much of the acreage that has been cleared is moderately eroded or severely eroded.

Almost all of the acreage of these soils has a cover of second-growth trees. The trees are mainly hardwoods, but there are some pines. Only a small acreage is cultivated. Much of the acreage is steep and is best suited to a cover of permanent vegetation. The less sloping areas are suitable for crops if a long cropping system is used.

Shubuta fine sandy loam, 5 to 8 percent slopes (SmC).—This deep, well-drained soil is on narrow ridgetops. The following describes a representative profile in a forested area:

A_1 0 to 1 inch, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 7 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak to moderate, fine, granular structure; very friable.

B_1 7 to 12 inches, yellowish-red (5YR 5/6 to 5/8) clay loam; weak to moderate, fine and medium, subangular blocky structure; friable to firm.

B_{21} 12 to 21 inches, yellowish-red (5YR 4/6) sandy clay; strong, medium, subangular and angular blocky structure; firm; a few fine variegations of yellowish brown (10YR 5/4) or strong brown (7.5YR 5/6); a few small pebbles, and a few, small, black concretions.

B_{22} 21 to 30 inches, red (2.5YR 4/6) sandy clay; strong, medium, subangular and angular blocky structure; firm or very firm; few to common variegations of yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6); a few small pebbles of sandstone, and a few, small, black concretions.

B_3 30 to 38 inches, yellowish-red (5YR 5/6) clay loam; common variegations of strong brown (7.5YR 5/6), dark red (2.5YR 3/6), and light brownish gray (10YR 6/2); weak or moderate, medium, subangular blocky structure; firm; a few pebbles of sandstone, and a few concretions.

C 38 to 40 inches +, variegated yellowish-red (5YR 4/6 to 5/6), dark red (2.5YR 3/6), yellowish-brown (10YR 5/6), and gray stratified layers of sand and clay that are mostly sandy clay with thin lenses of gray clay; firm and compact; many mica flakes.

In places the soil has a thin layer of loess, and here the texture of the surface layer is loam or silt loam. Depth to the stratified parent material ranges from 16 to 54 inches, and the material is highly variable in texture and color. In some places sandstone and pebbles 1/4 to 3 inches in diameter are common. In several areas slopes are 2 to 5 percent.

Shubuta fine sandy loam, 5 to 8 percent slopes, is very strongly acid. It is low in natural fertility and moderately low in moisture-supplying capacity. Permeability is rapid in the surface layer but moderate in the subsoil. Runoff is medium to high. Internal drainage is medium. This soil has good tilth, but it erodes readily when it is cultivated.

Most of this soil has a cover of cutover trees, but it could be used for tilled crops occasionally. All of the crops that are commonly grown are suited. Large amounts of fertilizer are required, and the response to fertilizer and to other good management is moderate. Small grains are probably better suited than row crops. They grow when moisture is most plentiful and the plants can make most efficient use of the fertilizer. (Capability unit IIIe-3; woodland group 5.)

Shubuta fine sandy loam, 5 to 8 percent slopes, eroded (SmC2).—This soil has a thinner surface layer than Shubuta fine sandy loam, 5 to 8 percent slopes. Part of the original surface layer has been lost through erosion, and material from the former subsoil has been mixed with the remaining surface layer by plowing.

The present surface layer is yellowish-brown to reddish-brown fine sandy loam that is 5 to 6 inches thick. Just below is firm, yellowish-red sandy clay.

In places yellowish-red sandy clay is exposed. In a few places slopes are 3 to 4 percent, but these areas are eroded, and their surface layer is reddish and clayey.

Shubuta fine sandy loam, 5 to 8 percent slopes, eroded, is low in moisture-supplying capacity and in fertility. The soil has good tilth, but it is difficult to keep it from eroding. The response to fertilizer is moderate.

Most of the acreage of this soil has been used for crops. Now, much of it is idle or is used as unimproved pasture. The areas that are cultivated are in cotton, corn, or annual lespedeza.

A row crop can be grown on this soil if a long cropping system is used. The soil is well suited to small grains and to sod crops. Large amounts of fertilizer are required for good yields. (Capability unit IIIe–3; woodland group 5.)

Shubuta fine sandy loam, 8 to 12 percent slopes (SmD).—Except for having stronger slopes, this soil is similar to Shubuta fine sandy loam, 5 to 8 percent slopes.

Nearly all areas of this soil are in cutover forests consisting of mixed upland hardwoods and pines. The cleared areas are idle or are used for unimproved pastures, or, in a few places, for row crops or hay.

The low fertility, low moisture-supplying capacity, and high hazard of erosion limit this soil to close-growing crops and an occasional cultivated crop. Small grains and grasses and legumes grown for hay or pasture are better suited than row crops. They make more efficient use of the moisture that is available. Large amounts of fertilizer are required, and the response to such applications is fair to moderate. (Capability unit IVe–2; woodland group 5.)

Shubuta fine sandy loam, 12 to 25 percent slopes (SmE).—This soil has short, steep slopes and is on irregular choppy hills. Most of the acreage is in forest and in these areas the surface layer is a fairly thick fine sandy loam. In the areas that have been cleared the surface layer is thinner and ranges from about 4 to 6 inches in thickness.

This soil is too steep for crops that are tilled. If it is cultivated, it erodes readily, and the crops make poor yields. It can be used for pasture or trees. Pasture plants that tolerate drought are better suited than other pasture plants. Fair to good pastures can be established, but large amounts of fertilizer are required. (Capability unit VIe–2; woodland group 5.)

Shubuta fine sandy loam, 25 to 45 percent slopes (SmF).—This steep soil is on ridge slopes. All of the areas are in forests of upland hardwoods and pines or have a cover of brush. The trees are of poor quality.

Because of the steep slopes and high hazard of erosion, this soil is not suited to either crops or pasture. The soil also has low moisture-supplying capacity. Consequently, the response to management and fertilizer is fairly low. The soil is best suited to trees. (Capability unit VIIe–1; woodland group 5.)

Shubuta clay loam, 5 to 8 percent slopes, severely eroded (ShC3).—Because of erosion, the surface layer of this soil is reddish and clayey.

This soil is very low in moisture-supplying capacity and in fertility. Runoff is rapid. Tilth is poor, and the hazard of erosion is high.

Most of the acreage of this soil is idle, is sparsely vegetated, or has reverted to forests of mixed hardwoods and pines. A small area is used as unimproved pasture, and several acres are used for row crops.

This soil is poorly suited to crops that are tilled. Cotton is better suited than corn, but neither crop makes high yields. Small grains and grasses and legumes grown for hay or pasture are better suited than row crops. The small grains, grasses, and legumes make fair to good yields but require large amounts of fertilizer. (Capability unit IVe–2; woodland group 5.)

Shubuta clay loam, 8 to 12 percent slopes, severely eroded (ShD3).—This soil has a reddish, clayey surface layer and subsoil.

The soil is very low in natural fertility. It is droughty and has fairly poor tilth. Runoff is rapid, and the hazard of erosion is high. The response to fertilizer is moderately low.

Much of the acreage of this soil is idle and has a thin cover of small bushes, but in some places there are trees that are marketable. A few acres are used for cotton or corn, and a small acreage is used for unimproved pasture.

If good management is used and plants that tolerate drought are grown, this soil can be used for pasture. Large amounts of fertilizer are required for fair to good yields of forage. It is hard to get a good stand of pasture plants in some places. Tall fescue, bermudagrass, and whiteclover are among the plants that are best suited. (Capability unit VIe–2; woodland group 5.)

Shubuta clay loam, 12 to 25 percent slopes, severely eroded (ShE3).—This steep soil is on irregular hills. Much of the original surface layer has been lost through erosion. The present surface layer is largely material from the former subsoil and is clayey. In some places there are shallow gullies.

Much of the acreage of this soil is in unimproved pasture or is idle, but a few areas are used for crops.

The low moisture-supplying capacity, high hazard of erosion, and poor tilth make this soil poorly suited to crops that are tilled. The soil is best suited to pasture plants or to trees. Tall fescue, bermudagrass, whiteclover, and other plants that resist drought are better suited than other pasture plants. Yields are fair, but large amounts of fertilizer are required. (Capability unit VIIe–1; woodland group 5.)

Shubuta-gullied land complex (Sp).—Most of the original surface layer in this complex, and in many places part of the subsoil, have been lost through erosion. Numerous shallow gullies, and in a few places deep gullies, have formed. The gullies occupy as much as 15 percent of the area. Slopes range between about 10 and 25 percent.

Some areas are practically bare; others support thin stands of mixed hardwoods and pines. In some places the pines are of cordwood size.

Shubuta-gullied land complex is not suited to crops or pasture. It is best to use it for trees. (Capability unit VIIe–1; woodland group 5.)

Silerton Series

The Silerton series consists of well drained or moderately well drained soils on irregular hills. These soils developed in a thin mantle of loess that overlies coastal plain sandy clay. The loess is about 18 to 30 inches thick. The soils are mostly on broad, undulating to rolling caps of hills where the relief is smooth enough to retain the cap of loess. Much of the acreage is in the southeastern

part of the county, but there are a few areas in other parts. Slopes range from about 2 to 12 percent.

In areas that are not eroded, the surface layer is about 8 inches of friable, light yellowish-brown silt loam. The subsoil is chiefly strong-brown silty clay loam to a depth of about 24 inches. It overlies stratified and variegated coastal plain sandy clay and clay.

Silerton soils are near the Dulac soils, which lie on the more nearly level adjoining areas. They are also near the Shubuta soils, which commonly are on the adjoining steeper slopes. They most nearly resemble the Dulac soils, but are better drained than those soils, which have a well-developed fragipan. Silerton soils are not so red as the Shubuta soils, which are finer textured and have developed entirely in coastal plain sandy clay and clay.

These soils are very strongly acid. They are low in fertility and in organic matter. The soils are friable and have good tilth. They respond to fertilizer and to other good management.

About three-fourths of the acreage of these soils is in forests of mixed hardwoods and pines. Areas that are cleared are used mainly for corn, cotton, and annual lespedeza, but some vegetables are grown. These soils have good potential for row crops and pastures, even though they are moderately erodible and are not suited to frequent cultivation.

Silerton silt loam, 2 to 5 percent slopes (SrB).—This well drained or moderately well drained soil is mostly on the tops of hills. The following describes a representative profile in a forested site:

A_1 0 to 1 inch, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; very friable.

A_2 1 to 7 inches, grayish-brown to light yellowish-brown (10YR 5/2 to 6/4) silt loam; weak, fine, granular structure; very friable.

B_1 7 to 12 inches, yellowish-brown (10YR 5/4) or strong-brown (7.5YR 5/6) silt loam or coarse silty clay loam; weak, medium, angular blocky structure; friable.

B_2 12 to 24 inches, strong-brown (7.5YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; friable.

B_{3b} 24 to 36 inches, variegated yellowish-red (5YR 4/8), dark-red (2.5YR 3/6), strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/4), and light brownish-gray (10YR 6/2) clay loam or sandy clay; moderate, medium, angular and subangular blocky structure; firm; content of sand generally increases with increasing depth.

C 36 inches +, variegated red, yellowish-red, brown, yellowish-brown, light brownish-gray, and gray, stratified coastal plain materials that are dominantly of sandy clay, clay, and sandy clay loam texture; weak, coarse, angular blocky structure to massive; firm.

The mantle of silt ranges from 12 to 36 inches in thickness. In places the surface layer is loam. In a few areas the subsoil is clay loam or sandy clay loam. There is a thin, weak, discontinuous fragipan in many places where the loess and coastal plain material come into contact. The mantle of silt is generally free of gravel, but in places the lower subsoil and substratum contain coastal plain gravel and iron-cemented plates.

Silerton silt loam, 2 to 5 percent slopes, is strongly acid to very strongly acid. It is low in fertility and moderate in moisture-supplying capacity. Because of its mild slopes and desirable structure, the soil is easy to work and fairly easy to keep from eroding. Root penetration is good. The soil responds well to fertilizer.

Large areas of this soil remain in forests. The kinds of trees vary but are predominantly hardwoods or shortleaf pines. Areas that are cultivated are in corn, cotton, lespedeza, and peppers.

This soil is not suited to intensive cultivation, but it can be cultivated every 2 or 3 years. Large amounts of fertilizer are required. If adequate amounts of fertilizer are applied and other good management is used, all of the crops common to the county can be grown and good pastures can be established. Yields are good. Alfalfa can be grown if adequate amounts of fertilizer are added and proper management is used. (Capability unit IIe-1; woodland group 1.)

Silerton silt loam, 2 to 5 percent slopes, eroded (SrB2).—The surface layer is thinner because of erosion, but this soil is otherwise similar to Silerton silt loam, 2 to 5 percent slopes. The present surface layer is about 4 to 6 inches of friable, grayish-brown or light yellowish-brown silt loam.

There is slightly more runoff on this soil than on Silerton silt loam, 2 to 5 percent slopes. This soil is low in fertility. It has good tilth and is easy to work. It is friable, and roots penetrate it easily.

Most areas of this soil are used for cotton, corn, and annual lespedeza, but a small acreage is used for vegetables.

If adequate amounts of fertilizer are added and other good management is used, all of the crops common to the county can be grown and yields are good. Large amounts of fertilizer are required. (Capability unit IIe-1; woodland group 1.)

Silerton silt loam, 5 to 8 percent slopes (SrC).—Except for having stronger slopes, this soil is similar to Silerton silt loam, 2 to 5 percent slopes. The areas are on ridgetops and upper side slopes.

Nearly all areas of this soil are in forests consisting of mixed hardwoods and shortleaf pines.

Because of steeper slopes, more rapid runoff, and slightly greater hazard of erosion, this soil has a narrower range in use than Silerton silt loam, 2 to 5 percent slopes. If the soil were used for row crops, yields would be slightly lower and requirements for a well-planned cropping system would be greater. All of the row crops and pasture plants commonly grown in the county are suitable. The soil responds well to fertilizer and to other good management. (Capability unit IIIe-1; woodland group 1.)

Silerton silt loam, 5 to 8 percent slopes, eroded (SrC2).—This soil has lost part of its original surface layer through erosion. The present surface layer consists of material from the former upper subsoil that has been mixed with the remaining surface soil. This surface layer is brown or grayish-brown silt loam that is friable and 5 to 6 inches thick. Some areas are even more eroded, and in these the surface layer is friable, reddish-brown silty clay loam.

This soil is low in fertility and moderate in moisture-supplying capacity. The root zone is moderately thick and is permeable. The response to fertilizer is moderate.

This soil is used mostly for corn, cotton, annual lespedeza, and vegetables. All of the crops commonly grown in the county make fair to moderate yields on this soil. The soil is not suited to frequent use for row crops, however, because it erodes readily when it is cultivated.

(Capability unit IIIe–1; woodland group 1.)

Silerton silt loam, 8 to 12 percent slopes (SrD).—Except for stronger slopes and a solum that is thinner over coastal plain sandy clay, this soil is similar to Silerton silt loam, 2 to 5 percent slopes.

Runoff is rapid on this soil. The soil is fairly easy to work, but it is difficult to keep from eroding when it is cleared. The root zone is mostly in the upper 15 to 20 inches because most plant roots cannot penetrate the coastal plain materials that begin at this depth.

Most areas of this soil are in trees. The trees have been burned and cut over many times. Cull trees are common. Second-growth stands of mixed hardwoods and shortleaf pines predominate. Areas that are cleared are used mainly for unimproved pastures, but a few areas are in cotton or corn.

If it is cleared, this soil is better suited to small grains, hay, and pasture than to row crops. Row crops can be grown if large amounts of fertilizer are applied and the soil is otherwise well managed. Yields are moderate. The supply of moisture in the soil is not large enough that summer annual crops can make consistently high yields. (Capability unit IVe–1; woodland group 1.)

Silerton silty clay loam, 2 to 5 percent slopes, severely eroded (SsB3).—The surface layer of this soil is generally a friable, yellowish-brown or strong-brown silty clay loam. In a few places part of the original surface soil remains. There are shallow gullies in a few places.

This soil is low in fertility and moderately low in moisture-supplying capacity. Runoff is medium to rapid. Because of its favorable slopes and good structure, the soil is fairly easy to work and to conserve. This soil responds well to fertilizer and to other good management.

This soil is used and managed in about the same way as Silerton silt loam, 2 to 5 percent slopes, but yields are lower. If adequate amounts of lime and fertilizer are added and the soil is otherwise well managed, all of the crops common to the county can be grown. Yields are fair to good. The soil is not suited to frequent cultivation. The cropping system needed is one in which small grains are grown. The small grains will make adequate use of the moisture available in fall and early in spring. A row crop can be grown every 3 or 4 years. (Capability unit IIIe–1; woodland group 1.)

Silerton silty clay loam, 5 to 8 percent slopes, severely eroded (SsC3).—The surface layer of this soil is generally a friable, yellowish-brown to reddish-brown silty clay loam. In a few places there are gullies, and in places the underlying coastal plain material is exposed.

This soil is low in fertility and in moisture-supplying capacity. Runoff is rapid. The hazard of erosion is high.

This soil is suited to small grains, hay, and pasture. A row crop can be grown every 3 or 4 years, but yields are only about moderate. A cropping system is needed that includes a mixture of grasses and legumes resistant to drought. Large amounts of fertilizer are required for good yields. Use of stripcropping, terraces, and sod waterways will help to reduce runoff and loss of soil. (Capability unit IVe–1; woodland group 1.)

Silerton silty clay loam, 8 to 12 percent slopes, severely eroded (SsD3).—The surface layer of this soil is generally a friable, yellowish-brown or reddish-brown silty clay loam. In a few places grayish-brown silt loam from the original surface layer remains. There are gullies in a few places, and in many places the sandy clay coastal plain material is exposed.

This soil is low in fertility and in organic matter. The moisture-supplying capacity is very low. Runoff is rapid. The hazard of erosion is high. This soil is difficult to work and to conserve.

Most areas of this soil are idle or are used as unimproved pastures; only a small acreage is in crops. Many places formerly used for crops now have shortleaf pines and a few hardwoods on them.

This soil is poor for row crops and summer annual crops, but it is fair to good for small grains, early hay crops, and pasture. It is so droughty that summer annual crops do not make consistently high yields. Large amounts of fertilizer are required. If fertilizer is added and other good management is used, the response is only moderate. (Capability unit VIe–1; woodland group 1.)

Sumter Series

The Sumter series is made up of clayey soils that are droughty. These soils developed in coastal plain clay or silty clay in which there are numerous marine fossils and shells. The areas of these soils are small. They are on low, choppy hills in the northwestern part of the county. Slopes range between 5 and 35 percent but are mostly between 10 and 25 percent.

The surface layer of these soils is dark grayish-brown silty clay. The subsoil is light olive-brown or yellowish-brown clay that is plastic. At a depth between 15 and 24 inches, there is material containing much white and gray chalk, shells, and marl from the Selma formation. The Selma formation, also known as Selma chalk, is as much as 100 feet thick and is underlain by acid sandy clay.

Sumter soils are adjacent to the Boswell and Shubuta soils. They are more alkaline and are finer textured than those soils.

Sumter soils are neutral to mildly alkaline. They are high in fertility. Runoff is rapid. The subsoil is slowly permeable. Because the chalk and shell material is near the surface, the root zone is shallow.

These soils are mainly in forests of cedars and hardwoods. Some areas that were once cultivated have reverted to trees. The soils are not suited to crops but can be used for pastures or trees.

Sumter silty clay, 5 to 12 percent slopes, eroded (SuD2).—This slightly acid to neutral soil is mainly on the upper parts of low hills. The following describes a representative profile:

A_p 0 to 5 inches, dark grayish-brown (10YR 4/2) silty clay; moderate, medium, granular structure; sticky and plastic when wet.

B_{21} 5 to 12 inches, olive-brown (2.5Y 4/4) clay; strong, fine and medium, subangular blocky structure; very firm.

B_{22} 12 to 18 inches, light olive-brown (2.5Y 5/4) clay; strong, medium, subangular blocky structure; very firm.

C_1 18 to 24 inches, light olive-brown (2.5Y 5/4) silty clay; moderate, coarse, angular blocky structure; firm; numerous small fragments of white chalk.

C_2 24 inches +, white (2.5Y 8/1) silty clay loam that contains a large amount of chalk and shells that are calcareous.

This soil is high in natural fertility. Its moisture-supplying capacity is low. Permeability is moderately slow. The chalky, calcareous material is fairly near the surface, and the root zone is moderately shallow. Because the surface layer is high in clay, tilth is poor.

Most of the acreage is in cutover forest, but a few areas are used for pasture. Because of droughtiness and rapid runoff, the soil is not suited to crops that are tilled. Yields are low, even if the soil is well managed. The soil contains too much calcareous material for many of the common crops to grow well.

Sumter silty clay, 5 to 12 percent slopes, eroded, is better suited to pasture or trees than to crops that are tilled. Grasses and legumes grow well in spring when moisture is plentiful. The soil is well supplied with lime and probably has adequate amounts of phophorus and potassium, but it needs nitrogen. (Capability unit VIe-2; woodland group 6.)

Sumter silty clay, 12 to 35 percent slopes, eroded (SuF2).—This soil has a thinner surface layer than Sumter silty clay, 5 to 12 percent slopes, eroded. About 20 acres are severely eroded and very severely eroded.

Most of the areas of this soil are reverting to forests made up of hardwoods and cedars, but a few areas are used for unimproved pastures.

Because of steep slopes, shallowness, rapid runoff, and droughtiness, this soil is better suited to trees than to row crops or pasture. Fair pastures of legumes and grasses can be maintained, however, on the less steep areas. Black locust and cedar trees are well suited. (Capability unit VIe-2; woodland group 6.)

Susquehanna Series

The Susquehanna series is made up of somewhat poorly drained soils. These soils developed in acid coastal plain sandy clay and clay. They are in highly dissected areas on narrow ridgetops and on moderately steep side slopes of the ridges.

In Hardin County the Susquehanna soils are mapped only in a complex with soils of the Cuthbert series. A profile of a Susquehanna soil in this complex is given under the Cuthbert series.

Swamp

Swamp (Sw).—Most areas of this land type are on the level to slightly depressed flood plains of White Oak Creek. Small areas are in depressions of the Tennessee River flood plain. The areas are flooded frequently and are covered with water much of the time. The vegetation consists mainly of such water-tolerant trees as willow, sycamore, ash, sweetgum, water oak, alder, cypress, maple, water birch, and cottonwood. A few small marshy areas have a cover of grasses, cattails, rushes, and other herbaceous plants.

The soils that make up this land type are similar to the silt loams of the Waverly and Melvin series. The areas are not suitable for agriculture unless they are reclaimed by drainage. If the areas of Swamp were drained properly, they probably could be used in about the same way as the Waverly, Melvin, and Lee soils.

Although trees that tolerate wetness grow on the areas, Swamp is not suited to agricultural use and has not been placed in a capability unit. (Woodland group 8.)

Taft Series

The Taft series is made up of somewhat poorly drained soils that are mainly on high stream terraces. These soils developed in old, mixed alluvium derived mainly from loess, limestone, and coastal plain materials. The soils are near the headwaters of small drainageways and small streams that flow into the Tennessee River. The areas are nearly level to depressed. Slopes are less than 2 percent.

Areas of these soils commonly lie between the Paden and Pickwick soils. A few small areas are next to the Captina and Robertsville soils. The Taft soils are more poorly drained than the Paden and Captina soils, but they are better drained and less gray than the Robertsville.

Only one soil of the series—Taft silt loam—is mapped in this county.

Taft silt loam (0 to 2 percent slopes) (Ta).—This somewhat poorly drained soil is mainly on high stream terraces. The following describes a representative profile:

A_p 0 to 8 inches, grayish-brown (10YR 5/2) or dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; friable; a few black concretions.

B_1 8 to 13 inches, grayish-brown (10YR 5/2) and light brownish-gray (10YR 6/2) silt loam; common variegations of dark yellowish brown (10YR 4/4); weak, fine, granular structure; friable; a few black concretions.

B_2 13 to 16 inches, mottled yellowish-brown (10YR 5/4) and light brownish-gray (10YR 6/2) silt loam; weak, medium, subangular blocky structure; friable.

B_3 16 to 24 inches, mottled light olive-brown (2.5Y 5/6) and light brownish-gray (10YR 6/2) silt loam; weak, fine and medium, subangular blocky structure; firm; common black concretions.

B_{3m1} 24 to 28 inches, mottled light olive-brown (2.5Y 5/4), yellowish-brown (10YR 5/6), and light brownish-gray (10YR 6/2) silty clay loam; friable and brittle; weak, fine and medium, subangular blocky structure.

B_{3m2} 28 to 36 inches, mottled strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/6), light olive-brown (2.5Y 5/6), and gray (10YR 6/1) silty clay loam; weak, medium, subangular blocky structure; friable or brittle.

B_{3m3} 36 to 42 inches +, mottled light yellowish-brown (10YR 6/4), gray (10YR 6/1), brown (10YR 5/3) and yellowish-brown (10YR 5/6) silty clay loam; weak, medium, subangular blocky structure; friable to firm.

This soil is strongly acid to very strongly acid. It is low in natural fertility and in organic matter. Its moisture-supplying capacity is moderately low.

Most areas of this soil are used for corn, hay, and pasture. The areas on low terraces along the Tennessee River are flooded occasionally. Areas on the high terraces are not flooded, but water accumulates on the surface during winter and early in spring. Planting is, therefore, generally delayed.

Corn and cotton grow well on Taft silt loam in some years, but the risk is high that the crop will be lost because of a poor stand. The soil is well suited to sorghum and soybeans. It is also suited to tall fescue and whiteclover grown for pasture. Large amounts of fertilizer are required for good yields. (Capability unit IIIw-1; woodland group 7.)

Talbott Series

The Talbott series consists of well-drained soils that are fine textured and moderately deep. These soils formed in material weathered from clayey limestone that is interbedded with small amounts of shale. In some places, particularly in the northeastern corner of the county, the bedrock is cherty limestone.

In areas that are not eroded, the surface layer is brown silt loam or cherty silt loam. The subsoil is yellowish-red, very plastic clay or cherty clay. Depth to bedrock varies but is mostly between 3 and 5 feet. The areas that formed from cherty limestone material have many fragments of chert throughout the profile.

The Talbott soils are associated with the Colbert soils, but they are better drained, are deeper to bedrock, and are redder.

Talbott soils are strongly acid and are low in fertility. Generally, their moisture-supplying capacity is low, and they are droughty. Permeability is moderate in the surface layer but slow in the subsoil.

The Talbott soils are better suited to permanent vegetation than to crops that are tilled, but the less sloping areas can be used for crops.

Talbott silt loam, 2 to 5 percent slopes (TsB).—This well-drained soil is in small areas, mostly on the tops of hills. The following describes a representative profile in a forested area:

A_1 0 to 1 inch, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable.

A_2 1 to 6 inches, brown (10YR 4/3 to 5/3) silt loam; moderate, fine, granular structure; friable.

B_1 6 to 10 inches, reddish-brown (5YR 4/4) silty clay; moderate, fine, subangular blocky structure; firm; slightly sticky and plastic when wet.

B_2 10 to 22 inches, yellowish-red (5YR 4/6 to 4/8) clay; strong, medium, angular blocky structure; very firm; sticky and plastic when wet; a few, fine variegations of yellowish brown and strong brown; a few, small, black concretions and stains.

B_3 22 to 34 inches, yellowish-red (5YR 5/6) clay; common, medium variegations of yellowish brown, strong brown, and light brownish gray; strong, medium, angular blocky structure; very firm; very sticky and plastic when wet; a few, small, black concretions and stains.

C 34 to 60 inches, variegated yellowish-red, brownish-yellow, and strong-brown clay; massive; very firm; few to common fragments of limestone and chert.

D_r 60 inches +, bedrock of clayey limestone.

In many places there are pieces of chert, fragments of flaggy limestone, and outcrops of bedrock. In places the upper part of the profile formed partly in thin deposits of old alluvium, colluvium, and loess.

A few small areas of shallow to moderately deep, dusky-red and dark reddish-brown (purplish) soils were included with these soils in mapping. These included soils formed in material weathered from the Osgood limestone formation. A small part of the acreage is eroded, and there the surface layer is silty clay loam or silty clay.

Talbott silt loam, 2 to 5 percent slopes, is strongly acid. It is low in fertility. Roots penetrate the surface layer easily, but the plastic subsoil impedes the penetration of roots and the movement of moisture and air. Water is absorbed slowly. The moisture-supplying capacity is low because the clay tightly holds much of the absorbed water. Tilth is fair.

This soil is better suited to small grains, hay and pasture crops, and other close-growing crops than to row crops. Alfalfa, whiteclover, orchardgrass, and tall fescue are suitable plants for hay and pasture. Fairly large amounts of fertilizer are required for moderate yields. (Capability unit IIIe–3; woodland group 6.)

Talbott silt loam, 5 to 8 percent slopes (TsC).—This soil has stronger slopes but is otherwise similar to Talbott silt loam, 2 to 5 percent slopes. In places the soil is moderately eroded, and here the surface layer is silty clay loam. In small areas the red clay subsoil is exposed.

In some places the surface layer formed partly in loess, old alluvium, and colluvium. In these places and in places where erosion has been slight, the surface layer is a friable silt loam that is about 8 inches thick.

Runoff is moderately rapid on this soil, but internal drainage is medium to slow. The moisture-supplying capacity is low. Root penetration is slow. The response to fertilizer and management is moderate. Tilth is fair to good.

About three-fourths of the acreage is forested with mixed hardwoods and cedars. The rest is in row crops or pastures.

This soil is suited to all of the row crops and hay and pasture plants commonly grown, including alfalfa. It is not suited to frequent tillage, but row crops can be grown in long cropping systems. Small grains, hay, and pasture crops make better yields than row crops. Moderately large amounts of fertilizer are required. (Capability unit IIIe–3; woodland group 6.)

Talbott silt loam, 8 to 12 percent slopes (TsD).—This soil has stronger slopes but otherwise is similar to Talbott silt loam, 2 to 5 percent slopes. In a few areas the soil is eroded, and in these places the surface layer is silty clay loam or silty clay.

About 90 percent of this soil is in forests; the rest is in unimproved pasture or is idle.

The soil is better suited to close-growing crops than to row crops. Suitable pasture plants are lespedeza, whiteclover, orchardgrass, and tall fescue. The response to fertilizer is fair to good. (Capability unit IVe–2; woodland group 6.)

Talbott silt loam, 12 to 25 percent slopes (TsE).—This soil is on uplands where slopes are short and steep. It has more outcrops of bedrock than Talbott silt loam, 2 to 5 percent slopes. The surface layer is thin, and the subsoil is plastic and clayey. As a result, the moisture-supplying capacity is low.

Most areas of this soil are in cutover hardwoods and cedars. The acreage that is cleared is mainly in pasture and is moderately eroded.

This soil is not suited to crops that are tilled, but it can be used for pasture or for trees. Pasture plants that tolerate drought make good growth in spring if moderately large amounts of fertilizer are applied. (Capability unit VIe–2; woodland group 6.)

Talbott silty clay, 5 to 8 percent slopes, severely eroded (TtC3).—The surface layer of this soil is generally yellowish-red or reddish-brown silty clay. Some small areas are very severely eroded, and in these places the surface layer is red clay. There are shallow gullies in many places. More chert and more outcrops of bedrock are on the surface of this soil than on Talbott silt loam, 2 to 5 percent slopes.

Most areas of this soil are idle or are used as unimproved pasture. Many areas that once were used for crops are reverting to forests of mixed hardwoods and cedars. In a few places the soil is used along with other Talbott soils or with other nearby soils for row crops, hay, or pasture.

The poor tilth, high hazard of erosion, low fertility, and low moisture-supplying capacity make this soil better suited to pasture and small grains than to row crops. Hay and pasture crops make fair yields if suitable legumes and

grasses are seeded and adequate amounts of fertilizer are applied. (Capability unit VIe–2; woodland group 6.)

Talbott silty clay, 8 to 25 percent slopes, severely eroded (TtE3).—This soil has lost nearly all of its original surface layer and, in places, part of its subsoil. The present surface layer is yellowish-red or strong-brown silty clay that is firm and plastic. Fragments of chert washed from higher lying soils have collected on the surface in many places. There are outcrops of bedrock and shallow gullies in many places. In a few places the gullies cannot be crossed by farm machinery.

This soil is low in fertility and in moisture-supplying capacity. Infiltration is retarded by the clayey texture of the soil, and runoff is rapid. The hazard of erosion is very high. Tilth is poor.

All of this soil was cultivated at one time. Now, much of the acreage is in unimproved pastures or is idle. In many places there are thickets of small cedars.

This soil is poorly suited to crops that are tilled. If adequate amounts of fertilizer are applied, fair pasture consisting of legumes and grasses can be established. Because the soil is droughty, the pasture plants make most of their growth in spring. Small grains also make fair yields because they grow when moisture is most plentiful. The clayey texture of the surface layer, however, makes it difficult to get a good stand. (Capability unit VIe–2; woodland group 6.)

Talbott cherty silt loam, 5 to 12 percent slopes (TbD).—This soil is strongly acid, has a clayey subsoil, and occurs mainly on the upper parts of hills. The following describes a representative profile in a forested site:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) cherty silt loam; weak, fine, granular structure; very friable; ½ inch to 2 inches thick.

A_2 1 to 6 inches, light yellowish-brown (10YR 6/4) cherty silt loam; weak, fine, granular structure; very friable.

B_1 6 to 10 inches, yellowish-red (5YR 5/6 to 5/8) cherty silty clay loam; weak to moderate, fine, subangular blocky structure; friable; a few coatings or variegations of pale brown to yellowish brown; contains fewer fragments of chert than the A_2 layer.

B_2 10 to 28 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) cherty clay; strong, medium, angular blocky structure; firm; very hard when dry, plastic when wet; a few variegations of yellowish brown or strong brown.

B_3 28 to 38 inches, variegated yellowish-red (5YR 4/6 to 5/6), red (2.5YR 4/6), and yellowish-brown (10YR 5/4) cherty clay; strong, medium, angular blocky structure; very firm; in a few places there are partly weathered fragments of shale or small pockets of shale.

C 38 to 60 inches, variegated yellowish-red (5YR 4/6), strong-brown (7.5YR 5/6), and light brownish-gray (10YR 6/2) cherty clay; moderate, coarse, angular blocky structure; very firm; common to many fragments of chert that are 1 to 6 inches in diameter; a few small, olive-brown, partly weathered fragments of shale.

D_r 60 inches +, limestone bedrock.

This soil is strongly acid. It is low in natural fertility and in organic matter. The moisture-supplying capacity is low. Runoff and internal drainage are medium. Permeability is rapid in the surface layer but moderately slow in the clayey subsoil. The fragments of chert interfere with, but do not prevent, tillage.

Much of this soil is forested with hardwoods; only a small acreage is used for tilled crops.

Small grains, ryegrass, tall fescue, bermudagrass, and whiteclover are better suited to this soil than row crops. Even if large amounts of fertilizer are added, yields of row crops are only fair. (Capability unit IVe–2; woodland group 6.)

Talbott cherty silt loam, 12 to 25 percent slopes (TbE).—This soil generally has a thinner solum than Talbott cherty silt loam, 5 to 12 percent slopes. In areas that are eroded, the surface layer consists of material from the former upper subsoil that has been mixed with the remaining surface soil.

Nearly all areas of this soil are medium to small. They are mostly in forests made up of mixed upland hardwoods and a few cedars and pines. The trees have been cut over many times and are of poor quality. The areas that are eroded are mostly idle, are used for unimproved pastures, or are reverting to trees. A few areas have been improved and are used for pasture, but yields are low.

Because of steep slopes, chertiness, low fertility, low moisture-supplying capacity, and poor tilth, this soil is better suited to pasture or trees than to row crops. Pasture plants that resist drought can be grown if the soil is well managed, but yields are only fair. (Capability unit VIe–2; woodland group 6.)

Talbott cherty silt loam, 25 to 35 percent slopes (TbF).—This soil has a thinner solum than Talbott cherty silt loam, 5 to 12 percent slopes, and in places has more chert on its surface.

Included with this soil are small areas of Minvale, Ennis, and Lobelville soils that are on lower slopes and along drainageways.

Because of steep slopes, droughtiness, and low fertility, Talbott cherty silt loam, 25 to 35 percent slopes, is better suited to trees than to other uses. Nearly all areas are in forests of cutover hardwoods. On north-facing slopes this soil has a better supply of moisture for trees. (Capability unit VIIe–1; woodland group 6.)

Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded (TcD3).—The surface layer of this soil is generally cherty silty clay. The subsoil is similar to the surface layer but contains more clay. Because erosion has removed the finer soil material, fragments of chert have accumulated on the surface of this soil. In places a few shallow gullies have formed.

Much of the acreage of this soil is idle. Many areas are reverting to forests of hardwoods and pines; only a small acreage is used for unimproved pastures.

Because of steep slopes, low moisture-supplying capacity, and poor tilth, this soil is better suited to close-growing crops than to row crops. Yields of row crops are low, even if the soil is well fertilized. If adequate amounts of fertilizer are used and suitable legumes and grasses are seeded, fair to good pastures can be established. Small grains make fair to good yields because they grow when moisture is most plentiful. (Capability unit VIe–2; woodland group 6.)

Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded (TcE3).—The surface layer of this soil is mainly material from the former upper subsoil. It is yellowish-red cherty silty clay. In a few places gullies have formed. A few areas have slopes of 25 to 35 percent.

Most areas of this soil are reverting to forests; only a small acreage is used for unimproved pasture.

This soil is poorly suited to row crops. If adequate amounts of lime and fertilizer are applied, fair pasture consisting of legumes and grasses can be maintained. In

dry weather, however, pasture is damaged quickly. (Capability unit VIe–2; woodland group 6.)

Vicksburg Series

The Vicksburg series consists of deep soils that are well drained. These soils are on level flood plains of smaller streams. They consist of sediments washed from soils that formed on uplands from loess and coastal plain materials. Most of the acreage is in the western part of the county. Slopes are generally less than 3 percent.

The surface layer of these soils is brown or dark grayish-brown to yellowish-brown loam that shows little change to a depth of 30 inches. Below this depth the material has some gray mottles and much stratification.

These soils commonly lie alongside the Collins, Falaya, and Waverly soils of the bottoms, but they are better drained than those soils. They are lighter brown, more acid, and less productive than the Huntington soils. They contain less chert and more sand than the Ennis soils, which formed in material from cherty limestone.

The Vicksburg soils are strongly acid. They are moderate in fertility and high in moisture-supplying capacity. Tilth is good. These soils are productive, but the areas are flooded periodically during winter and early in spring. As a result, small grains are damaged and planting is delayed in spring.

These soils are used principally for corn, cotton, soybeans, grain sorghum, and other row crops. Yields are high.

Vicksburg loam (0 to 2 percent slopes) (Vb).—This deep, well-drained soil is on bottom lands.

The following describes a representative profile:

A_p 0 to 10 inches, brown (10YR 4/3 to 5/3) or dark grayish-brown (10YR 4/2) loam; weak, fine, granular structure; very friable.

C_1 10 to 18 inches, brown (10YR 5/3 to 4/3) or yellowish-brown (10YR 5/4) loam or fine sandy loam; weak, fine, granular structure; very friable.

C_2 18 to 32 inches, yellowish-brown (10YR 5/4) loam or fine sandy loam; weak, fine, granular structure; very friable.

C_3 32 to 48 inches +, light yellowish-brown (10YR 6/4) or brown (10YR 5/3) fine sandy loam; few to common mottles of light brownish gray, dark grayish brown, and gray; friable.

Included with this soil in mapping are a few areas where the profile contains more sand than the profile described. These included areas are less productive than the typical Vicksburg loam because the supply of moisture in the soil is limited.

Vicksburg loam is strongly acid. It is moderate in plant nutrients and organic matter. The moisture-supplying capacity is high. Permeability is very rapid in the surface layer and rapid in the subsoil. The soil is very friable and is easy to work.

This soil is suited to all of the crops commonly grown in the county. It can be used continuously for crops that are tilled, or it can be used in short cropping systems. The areas are flooded occasionally, however, in winter and spring. The response to management and fertilizer is high enough to justify adding large amounts of fertilizer. (Capability unit I–1; woodland group 4.)

Vicksburg loam, local alluvium (1 to 3 percent slopes) (Vc).—This soil is in small areas along small, intermittent drainageways and is more sloping than Vicksburg loam. Some areas receive overwash from adjacent higher lying areas, but crops on this soil are generally not damaged by flooding.

Farmers in the area prefer this soil for growing cotton because yields are consistently high. Corn, hay, and grasses and legumes also make high yields. The soil is suited to intensive tillage. If the soil is well fertilized, all crops make high yields. The response to fertilizer is high enough to justify adding large amounts. (Capability unit I–1; woodland group 4.)

Waverly Series

The Waverly series consists of poorly drained, strongly acid soils on bottom lands. These nearly level soils consist of mixed sediments washed from upland soils that formed from loess and coastal plain materials.

The surface layer, a dark grayish-brown or grayish-brown silt loam to fine sandy loam, is 6 inches thick. The subsoil is mottled grayish brown or light brownish gray to a depth between 6 and 12 inches; below that depth it is strongly mottled but predominantly gray.

Waverly soils lie alongside the Collins and Falaya soils. The Collins soils are moderately well drained, and the Falaya are somewhat poorly drained. Waverly soils are grayer throughout the profile than the Falaya soils. They are similar to the Melvin soils, which consist of recent alluvium from chert-free limestone. They are also similar to the Lee soils, which consist of sediments washed from cherty limestone soils.

If these soils are drained and well fertilized, crops make moderately high yields on them. The poor drainage and susceptibility to flooding, however, limit the number of crops that can be grown.

Waverly silt loam (0 to 2 percent slopes) (Wb).—This poorly drained soil is on first bottoms below areas of upland soils formed from loess and coastal plain materials.

The following describes a representative profile:

A_p 0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable.

C_{1g} 6 to 12 inches, light brownish-gray (10YR 6/2) silt loam; common mottles of light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/4); weak, fine, granular structure; very friable.

C_{2g} 12 to 20 inches, light brownish-gray (2.5Y 6/2) or gray (N 5/0) silt loam; common mottles of yellowish brown (10YR 5/4) to strong brown (7.5YR 5/6); massive; friable; common, small, black and very dark brown concretions.

C_{3g} 20 to 32 inches, gray (N 6/0) or light-gray (N 7/0) silt loam; many, fine, distinct mottles of yellowish red (5YR 4/6) and olive brown (2.5Y 4/4); massive; friable.

C_{4g} 32 to 48 inches +, gray (5Y 5/1 to 6/1) silt loam or stratified silt, sand, and clay; many mottles of light yellowish brown (10YR 6/4), strong brown (7.5YR 5/6), and light olive brown (2.5Y 5/4); massive; friable; few to common, black, soft concretions.

In most places the gray layers are silt loam, loam, and fine sandy loam, but there are strata or pockets of finer and coarser textured soils in many places.

Included with this soil are small areas that are permanently swampy.

Waverly silt loam is strongly acid. Its supply of organic matter and plant nutrients is moderate. Runoff is very slow. Permeability of the surface layer is very rapid, but that of the subsoil is moderate. The soil is sub-

ject to frequent overflow, especially during winter and spring. Much of the time, the water table is at or near the surface. If this soil is not too wet, it is easy to work. The soil responds well to fertilizer and to other good management.

In forested areas the vegetation consists chiefly of water-tolerant oaks, hickory, sweetgum, beech, birch, willow, maple, and, in places, cypress. About half of the acreage has been cleared and is used for summer annual crops and pasture; of these, many areas have been improved by artificial drainage and are used for crops that are tilled.

Crops on this soil are frequently lost or are damaged by excessive wetness or flooding. Small areas near the headwaters of streams receive more seepage than other areas of this soil, but they are easier to drain and are not flooded so frequently.

Drainage ditches can be used to help improve areas of this soil, although flooding cannot be entirely eliminated. In areas that have been drained, corn, cotton, soybeans, grain sorghum, and other crops common to the area can be grown. Areas that have not been drained are better suited to annual lespedeza, other annual hay crops, and pasture crops than they are to row crops. (Capability unit IIIw–2; woodland group 8.)

Waverly fine sandy loam (0 to 2 percent slopes) (Wa).—The surface layer of this soil is generally coarser textured than that of Waverly silt loam. In places there are strata of silt loam, loam, and loamy sand throughout the profile.

Much of this soil has been cleared, and most of the areas have been improved by artificial drainage.

This soil can be used about the same as Waverly silt loam. Yields are more variable, however, and are lower in dry seasons. If the areas are drained adequately, Waverly fine sandy loam is suited to corn, cotton, grain sorghum, tall fescue, and whiteclover. If the areas are not drained, the loss of row crops is likely to be high. (Capability unit IIIw–2; woodland group 8.)

Waynesboro Series

The Waynesboro series consists of deep or moderately deep soils that are well drained to excessively drained. These soils are on high stream terraces where they developed in old alluvium. The alluvium is mainly from sandstone but includes smaller amounts of limestone material and other materials. The soils are dominantly rolling or hilly. Slopes range from about 2 to 45 percent.

In areas that are not severely eroded, the surface layer of these soils is yellowish-brown fine sandy loam that is 6 to 8 inches thick and is friable. The subsoil is yellowish-red or red clay loam to a depth of about 30 inches and is also friable. The material just below has a few variegations of red, dark red, yellowish brown, and strong brown.

These soils are near the Pickwick and Paden soils, which are also on high stream terraces. Many areas are also adjacent to the Shubuta, Magnolia, and other soils of the Coastal Plain. The Waynesboro soils are similar to the Dexter soils, which are well drained but developed in alluvium made up of loess and coastal plain materials. They are coarser textured than the Pickwick soils, which formed in loess over old alluvium. The Waynesboro soils are more friable, are less red, and lack the mica of the Shubuta and Magnolia soils.

These soils are strongly acid and very strongly acid. They are low to very low in fertility. Permeability is very rapid in the surface layer and moderately rapid in the subsoil.

Among the soils in the Waynesboro series are fine sandy loams, gravelly sandy loams, and very gravelly sandy loams. There are also severely eroded phases in which the surface layer is clay loam or gravelly clay loam. The gravelly and very gravelly soils are on the strongest slopes, and more of their acreage is forested than that of the fine sandy loams. The fine sandy loams are used extensively for crops, but a considerable acreage is still in trees.

Waynesboro fine sandy loam, 2 to 5 percent slopes (WfB).—This deep, well-drained soil is in small to medium areas, mainly on the tops of low, irregular hills on high stream terraces. The following describes a representative profile in a forested site.

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 9 inches, yellowish-brown (10YR 5/4) or brown (10YR 5/3) fine sandy loam; weak to moderate, fine, granular structure; very friable.

B_1 9 to 14 inches, yellowish-red (5YR 5/6) or reddish-brown (5YR 4/4) clay loam; moderate, fine, subangular blocky structure; friable.

B_2 14 to 32 inches, yellowish-red (5YR 4/6 to 4/8) clay loam; moderate, fine or medium, subangular blocky structure; friable; a few small pebbles of chert and quartz.

B_3 32 to 44 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) clay loam or sandy clay loam; few to common variegations of yellowish brown or strong brown; weak to moderate, medium, subangular and angular blocky structure; friable to firm; few to common pebbles.

C 44 to 60 inches +, dark-red (2.5YR 3/6) or red (2.5YR 4/6) clay loam or sandy clay loam; variegations of yellowish brown, brown, or strong brown; weak, coarse, angular blocky structure or massive; friable or firm; few to many small pebbles.

In some places stratified sandy loam and loamy sand are common in the deeper part of the profile. The alluvial deposit ranges from about 2½ to 60 feet or more in thickness. Below a depth of 3 feet, the number of pebbles varies from few to many. Beds of gravel are common at a depth between 4 and 6 feet. In several areas the soil is eroded. Here, the surface layer is a brown fine sandy loam that is friable and 6 to 8 inches thick.

This soil is strongly acid. It is moderately high in moisture-supplying capacity, but it is low in natural fertility. Plant roots penetrate the soil easily. The soil has good tilth. It responds well to fertilizer.

Most of the acreage of this soil is in cutover pines and hardwoods. The areas that are cultivated are used fairly intensively for corn, cotton, or annual lespedeza.

Waynesboro fine sandy loam, 2 to 5 percent slopes, is well suited to all of the crops generally grown in the county, including alfalfa and truck crops. It can be used in moderately short cropping systems. If suitable legumes and grasses are seeded, adequate amounts of fertilizer are added, and the soil is otherwise well managed, good stands of pastures can be maintained. Large amounts of fertilizer are required for good yields of crops and pasture. (Capability unit IIe–1; woodland group 1.)

Waynesboro fine sandy loam, 5 to 8 percent slopes (WfC).—Most areas of this soil are on hilltops. The surface layer is mainly brown fine sandy loam that is 5 to 7 inches thick. In several acres the soil is eroded and yellowish-red or reddish-brown material from the former subsoil is exposed.

This soil has good tilth and is fairly easy to conserve. Runoff is medium to rapid. The hazard of erosion is moderate. The response to fertilizer is good.

The forested areas are mostly in cutover pines and hardwoods and are not eroded. The areas that are cleared are used mainly for cotton, corn, and annual lespedeza; a few areas are idle, and some are used for unimproved pastures.

This soil is suited to row crops, to hay and pasture crops, and to trees. It should not be cultivated frequently. Yields are moderately high if large amounts of fertilizer are added. (Capability unit IIIe–1; woodland group 1.)

Waynesboro fine sandy loam, 8 to 12 percent slopes (WfD).—In this soil the alluvial deposits are more variable in thickness than in Waynesboro fine sandy loam, 2 to 5 percent slopes. In a few places the soil is eroded.

In the areas that are eroded, the surface layer is a brown fine sandy loam that is friable and 4 to 6 inches thick. A few areas are even more eroded, and in these the reddish-brown clay loam is exposed. In these areas there is more quartzite gravel on the surface than on the other areas.

This soil is low to moderately low in fertility. It is moderately low in moisture-supplying capacity. Runoff is medium to rapid.

Except for a few areas that are eroded, this soil is in forests made up of pines and hardwoods.

This soil is better suited to small grains and to hay and pasture crops than to crops that require annual preparation of the seedbed. If adequate amounts of lime and fertilizer are applied and other good management is used, profitable yields can be obtained. (Capability unit IVe–1; woodland group 1.)

Waynesboro fine sandy loam, 12 to 35 percent slopes (WfF).—The profile of this soil is thiner than that of Waynesboro fine sandy loam, 2 to 5 percent slopes. In many places the areas are on the upper parts of long side slopes.

This soil is low in fertility and in moisture-supplying capacity. Permeability is moderately rapid. Runoff is rapid, and the hazard of erosion is high.

Except for a few eroded areas, this soil is in forests. The areas that are cleared are mainly idle or are used for unimproved pasture; only a few areas are used for crops that are tilled.

This soil is better suited to pasture and to trees than to crops that are tilled. Good pasture can be grown if large amounts of fertilizer are added. (Capability unit VIe–1; woodland group 1.)

Waynesboro clay loam, 2 to 5 percent slopes, severely eroded (WcB3).—This soil has lost much of its original surface layer through erosion. The present surface layer is reddish-brown or yellowish-red clay loam that is friable.

In places there are small patches of the original surface layer, a brown fine sandy loam. In other places redder sandy clay loam from the deeper part of the former subsoil is exposed. There are shallow gullies in many places. Small quartzite pebbles are common on the surface.

This soil is low in fertility and moderately low in moisture-supplying capacity. It is fairly easy to work when it is slightly moist, but it is somewhat cloddy when dry. The response to fertilizer and to other management is moderate.

A large acreage of this soil is idle, but a few areas are in cotton and corn or are used for unimproved pastures.

This soil is suited to all of the row crops and hay and pasture plants that are commonly grown. Because of the limited supply of moisture, yields of small grains, hay and pasture crops, and other close-growing crops are higher than those of row crops. The soil is very low in lime, nitrogen, phosphorus, and potassium. Consequently, large amounts of fertilizer are required for good yields of all crops. (Capability unit IIIe–1; woodland group 1.)

Waynesboro clay loam, 5 to 8 percent slopes, severely eroded (WcC3).—The surface layer of this soil is mainly yellowish-red or reddish-brown clay loam that is friable to firm. It is 4 or 5 inches thick. Small quartzite pebbles have collected on the surface. In many places gullies are common, and in some places the gullies occupy 5 percent of an area.

This soil is low in fertility and in moisture-supplying capacity. Runoff is rapid, and the soil is susceptible to further erosion. The content of moisture over which the soil can be tilled is fairly narrow.

Most of the acreage of this soil is idle or is used for unimproved pasture. Only a small acreage is used for row crops, hay, or improved pasture.

This soil is better suited to small grains and to hay and pasture crops than to crops that are tilled or that require annual preparation of the seedbed. If a long cropping system is used, a row crop can be grown. Yields are fairly low. (Capability unit IVe–1; woodland group 1.)

Waynesboro clay loam, 8 to 12 percent slopes, severely eroded (WcD3).—Nearly all of the original surface layer of this soil has been removed by erosion. The present surface layer consists chiefly of material from the former upper subsoil. It is reddish-brown or yellowish-red clay loam that is friable to firm. A few quartzite pebbles have collected on the surface. Gullies are common, and in some places the gullies occupy as much as 10 percent of an area.

This soil is low in fertility and in moisture-supplying capacity. Tilth is fair to poor. The soil is easy to work when moist, but it is cloddy when dry. The response to fertilizer is generally moderate.

This soil is poor to fair for row crops, but it is fair to good for small grains and hay and pasture crops. It is hard to get a good stand of plants because of the clayey texture of the surface layer. Close-growing crops on this soil respond better than row crops if fertilizer is applied. (Capability unit IVe–1; woodland group 1.)

Waynesboro clay loam, 12 to 35 percent slopes, severely eroded (WcF3).—The surface layer of this soil is mainly reddish-brown to yellowish-red clay loam that is friable. In a few places the original brown or dark grayish-brown surface layer remains. Because the finer soil material has been removed by erosion, a few quartzite pebbles have accumulated on the surface. Gullies are common, and in places they occupy as much as 10 percent of the surface area.

Practically all areas of this soil were once used for crops, but now bushes, briers, and weeds are growing on them. A few areas are used for unimproved pastures.

The steep slopes, poor tilth, and low fertility and moisture-supplying capacity limit the use of this soil. The soil is suited to pasture or to trees. Yields of forage are fair to good if moderately large amounts of fertilizer are used. (Capability unit VIe–1; woodland group 1.)

Waynesboro gravelly sandy loam, 5 to 8 percent slopes (WmC).—This moderately deep, well-drained soil is on ridgetops and side slopes. Gravel makes up 15 to 50 percent of the soil mass. The following describes a representative profile in a forested site:

A_1 0 to 2 inches, very dark gray (10YR 3/1) gravelly sandy loam; weak, fine, granular structure; very friable; contains many small pebbles of quartz and chert.

A_2 2 to 9 inches, yellowish-brown (10YR 5/4) gravelly sandy loam; weak, fine, granular structure; very friable; the gravel is mostly chert and is less than 1 inch in diameter.

B_1 9 to 12 inches, yellowish-red (5YR 5/6) gravelly sandy clay loam; weak, fine, subangular blocky structure; friable; the gravel is chiefly chert and is as much as 2 inches in diameter.

B_2 12 to 22 inches, red (2.5YR 4/6) gravelly clay loam; moderate, medium, subangular blocky structure; friable; the gravel is chiefly chert and is as much as 2 inches in diameter.

B_3 22 to 36 inches, variegated red (2.5YR 4/6), dark-red (2.5YR 3/6), strong-brown (7.5YR 5/6), brownish-yellow (10YR 6/6), and light brownish-gray (2.5Y 6/2) gravelly clay loam; massive; firm.

C 36 to 48 inches +, beds of gravel with sandy clay to sand between the pieces of gravel; the gravel is chiefly chert, and most of it is less than 2 inches in diameter.

The content of gravel increases with increasing depth, and the subsoil is very gravelly. In some places the soil formed partly in loess and the surface layer is gravelly loam or gravelly silt loam. Figure 10 shows a profile of a Waynesboro gravelly sandy loam in a newly excavated gravel pit.

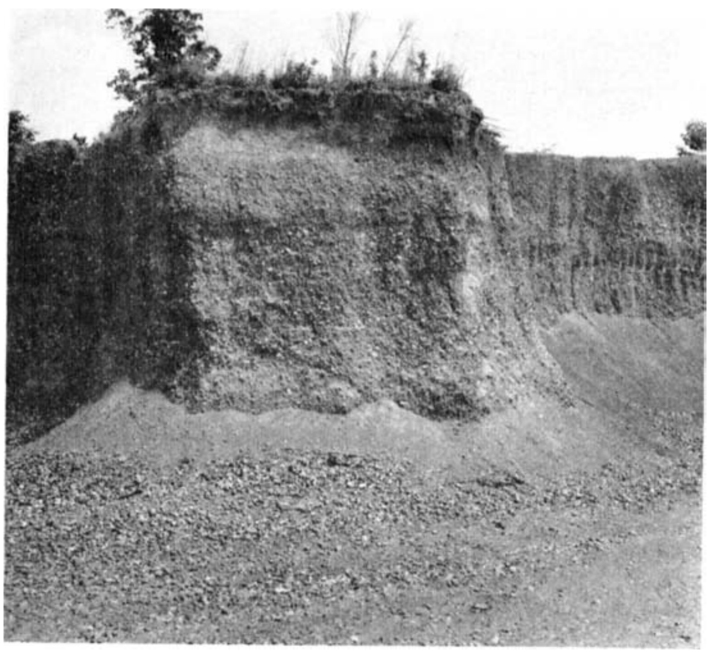

***Figure 10.*—Profile of a Waynesboro gravelly sandy loam in a newly excavated gravel pit.**

Waynesboro gravelly sandy loam, 5 to 8 percent slopes, is strongly acid. It is low in fertility, organic matter, and moisture-supplying capacity. Runoff is medium. The soil is very permeable, and internal drainage is rapid.

All areas of this soil are in trees. The soil is only fair for row crops because the supply of moisture is too low for the crops to make consistently high yields. Small grains and hay and pasture crops make moderately high yields, but large amounts of fertilizer are required. Crops that mature early are better suited than those that make most of their growth in summer and fall. (Capability unit IIIe-1; woodland group 2.)

Waynesboro gravelly sandy loam, 8 to 12 percent slopes (WmD).—This soil is low in fertility and moisture-supplying capacity. Runoff is rapid.

Except for a few areas that are used principally for unimproved pasture, nearly all areas of this soil are in trees.

If a cropping system is used, more careful management is required to control erosion on this soil than on Waynesboro gravelly sandy loam, 5 to 8 percent slopes. Small grains and the grasses and legumes that resist drought make fair yields if adequate amounts of fertilizer are applied and the soil is otherwise well managed. (Capability unit IIIe-1; woodland group 2.)

Waynesboro gravelly sandy loam, 12 to 25 percent slopes (WmE).—In this soil the alluvial deposits are generally less thick than in Waynesboro gravelly sandy loam, 5 to 8 percent slopes. In some places this soil is moderately eroded. Here, the surface layer is reddish-brown gravelly sandy loam that is 4 to 6 inches thick.

This soil is low in moisture-supplying capacity. The response to fertilizer is moderate.

The use of this soil is limited by its strong slopes and coarse texture. Nearly all areas are in forests of hardwoods and pines.

This soil is better suited to pasture or trees than to crops that are tilled. Fair to good yields of forage can be obtained if suitable plants are seeded, fertilizer is added according to the needs indicated by soil tests, and the soil is otherwise well managed. The growth of pasture plants is fairly small in the average summer and fall. (Capability unit VIe-1; woodland group 2.)

Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded (WgD3).—This soil has lost nearly all of its original surface layer through erosion. The present surface layer is reddish-brown gravelly clay loam. Because the finer particles have been removed by erosion, gravel has accumulated on the surface. Shallow gullies are common.

This soil is low in fertility and in moisture-supplying capacity. Runoff is rapid. The soil has poor tilth and is difficult to conserve.

The soil is fair to poor for row crops, but it is fair to good for small grains and hay and pasture crops. In places it is difficult to obtain a good stand of plants because of the gravelly, clayey surface layer. Large amounts of fertilizer are required, and the response to fertilizer is moderately low. (Capability unit IVe-1; woodland group 2.)

Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded (WgE3).—This soil has lost most of its original surface layer through erosion. The present surface layer varies in color, but in most places it is reddish-brown or yellowish-red gravelly clay loam. The amount of gravel that accumulates on the surface increases as increasing amounts of finer textured material are removed by erosion. In many places there are a few gullies.

The steep slopes, poor tilth, and low moisture-supplying capacity limit the use of this soil to pasture or trees. Much of the soil is idle, but a small acreage is used for

pasture. Pasture plants that resist drought should be selected. Yields of forage are about medium if moderately large amounts of fertilizer are added. (Capability unit VIe-1; woodland group 2.)

Waynesboro very gravelly sandy loam, 12 to 25 percent slopes (WnE).—This excessively drained soil is on uplands; 50 percent or more of the soil mass consists of gravel that was probably in an old terrace. The following describes a representative profile in a forested site:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) very gravelly sandy loam; weak, fine, granular structure; very friable.

A_2 1 to 9 inches, yellowish-brown or light yellowish-brown (10YR 5/4 to 6/4) very gravelly sandy loam; weak, fine, granular structure; very friable.

B_1 9 to 12 inches, yellowish-red (5YR 5/6) very gravelly clay loam; moderate, medium, subangular blocky structure; friable.

B_{21} 12 to 20 inches, yellowish-red (5YR 4/6) or red (2.5YR 5/6) very gravelly clay loam; moderate, medium, subangular blocky structure; firm.

B_{22} 20 to 38 inches, yellowish-red (5YR 4/6) and dark-red (2.5YR 3/6) very gravelly clay loam; moderate, medium, subangular blocky structure; firm.

C 38 to 72 inches +, beds of gravel or stratified gravel and sand that contain smaller amounts of sandy clay loam, clay loam, or sandy clay.

In the uppermost 10 to 14 inches, gravel makes up about 50 percent of the soil mass. Below this depth, the gravel occupies 75 to 90 percent of the soil mass. Most of the gravel is less than 2 inches in diameter. Conglomerate and cementations are more common in the horizons in the lower part of the profile than in the upper part. In many places there are conglomerate boulders and stones on the surface. The alluvial deposits range from as little as 2 or 3 feet thick to 50 feet or more.

This soil is strongly acid to very strongly acid. It is very low in plant nutrients, organic matter, and moisture-supplying capacity. The soil is excessively drained and is very droughty. Permeability is very rapid. The large amount of gravel makes the soil open and porous.

All areas of this soil are in trees, and the soil is probably best suited to that use. The soil is poorly suited to crops and pasture. The lack of moisture would keep yields low, even if the fertility was raised to the required level and other good management was used. (Capability unit VIIs-1; woodland group 9.)

Waynesboro very gravelly sandy loam, 5 to 12 percent slopes (WnD).—This soil is in small areas on the crests of hills. It has a thicker surface layer and contains slightly less gravel than Waynesboro very gravelly sandy loam, 12 to 25 percent slopes.

The large amount of gravel and the very low moisture-supplying capacity make this soil poorly suited to row crops. Small grains and some hay and pasture crops make fair to good yields. Early maturing crops make moderate yields if fertilizer is added, but summer annuals and late-maturing crops make low yields. (Capability unit IVs-1; woodland group 9.)

Waynesboro very gravelly sandy loam, 25 to 45 percent slopes (WnF).—This soil has a thinner profile in many places than Waynesboro very gravelly sandy loam, 12 to 25 percent slopes.

The areas of this soil that once were cultivated are now largely reverting to trees; only a few areas are used for unimproved pastures.

Mainly because of the steep slopes, large amounts of gravel, and low fertility and moisture-supplying capacity, this soil is not suited to crops or pasture. It is best suited to trees. (Capability unit VIIs-1; woodland group 9.)

Wolftever Series

The Wolftever series consists of well drained to moderately well drained soils on low terraces. These soils are on broad, level areas and in convex areas on the Tennessee River flood plain and along streams that receive the backwater of that river. The areas are small to large.

The surface layer of these soils is a dark grayish-brown silt loam that is friable and is 4 to 8 inches thick. The subsoil is yellowish-brown silty clay loam that is compact and has a few mottles. At a depth below 24 inches, mottles are common.

The Wolftever soils are near the Beason, Captina, Sequatchie, and Robertsville soils, which are also on terraces. They are also near the Egam, Lindside, and Huntington soils and the Melvin and Newark silt loams, which are on bottoms. The Wolftever soils lack the well-defined fragipan typical of the Captina soils. They are better drained and darker colored than the Beason soils. They occupy positions similar to those of the Sequatchie soils, but they are finer textured, lighter colored, and less friable than those soils.

The Wolftever soils are medium acid to strongly acid. They are moderately low in fertility and in moisture-supplying capacity. Internal drainage is moderately slow. Permeability is moderate in the surface layer but moderately slow in the subsoil.

Much of the acreage of these soils is used for corn, soybeans, grain sorghum, small grains, and annual and sericea lespedezas.

Wolftever silt loam, 2 to 5 percent slopes (WoB).—This well drained to moderately well drained soil is on low terraces. The following describes a representative profile in a cultivated site:

A_p 0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable.

B_1 8 to 15 inches, brown to dark-brown (10YR 4/3) silty clay loam; moderate, fine or medium, subangular blocky structure; friable to firm.

B_2 15 to 26 inches, yellowish-brown (10YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; firm, compact, slightly sticky and slightly plastic when wet; few, fine, faint mottles of light brownish gray (10YR 6/2); a few, small, brown to black concretions and segregations.

B_3 26 to 38 inches, yellowish-brown (10YR 5/4) silty clay loam; common, faint mottles of light brownish gray (10YR 6/2) and pale brown (10YR 6/3); moderate, medium, angular blocky structure; firm and compact; slightly sticky and plastic when wet; common, small, dark reddish-brown concretions.

C 38 to 50 inches +, yellowish-brown (10YR 5/6 to 5/4) silty clay loam; common mottles of light brownish-gray (10YR 6/2) and gray (10YR 5/1); moderate, medium, angular blocky structure; few to common, small, black concretions.

In a small acreage the surface layer is loam or fine sandy loam. Mottling begins in the upper subsoil, and the number and distinctness of the mottles generally increase with increasing depth. The texture of the subsoil and of the layers below is silty clay loam, clay loam, or silty clay. In places there are a few pebbles on the surface and throughout the soil profile.

Runoff is medium on this soil. Internal drainage is moderately slow, and the moisture-supplying capacity is moderately low. This soil is fairly easy to work and to conserve.

Flooding in winter and spring is the main limitation to use of this soil. The soil is suited to corn, cotton, soybeans, small grains, grain sorghum, and annual lespedeza. Yields are high if large amounts of fertilizer are applied. (Capability unit IIe–2; woodland group 3.)

Wolftever silt loam, 0 to 2 percent slopes (WoA).—In this soil mottles are common nearer the surface than in Wolftever silt loam, 2 to 5 percent slopes. The surface layer is a brown or dark grayish-brown silt loam that is friable and 6 to 10 inches thick.

Because of the smoother relief, runoff is slower than on Wolftever silt loam, 2 to 5 percent slopes, and this soil is less susceptible to erosion. Also, this soil is slightly slower to warm in spring.

This soil can be used a little more intensively than Wolftever silt loam, 2 to 5 percent slopes. Corn, soybeans, grain sorghum, and hay crops make medium yields. Yields can be increased if lime and fertilizer are added and sod crops are grown in the cropping system. (Capability unit IIw–2; woodland group 3.)

Wolftever silt loam, 2 to 5 percent slopes, eroded (WoB2).—The surface layer of this soil is thinner than that of Wolftever silt loam, 2 to 5 percent slopes. It generally is brown silt loam that is 5 or 6 inches thick. In places part of the upper subsoil has been mixed with the remaining surface layer by plowing. In these places the surface layer is yellowish-brown silty clay loam.

Most of the acreage of this soil is used for corn. The soil is suited to most of the row crops and pasture plants that are commonly grown. Its use is somewhat limited, however, by the slope, moderately slow internal drainage, and flooding in winter and spring. If large amounts of fertilizer are added, yields are moderately high. (Capability unit IIe–2; woodland group 3.)

Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded (WvB3).—This soil is on short side slopes beside broader, gently sloping and nearly level areas. The surface layer is brown or yellowish-brown silty clay loam.

The soil is low in fertility, organic matter, and moisture-supplying capacity. As the result of erosion, tilth is poor. The surface of the soil crusts and becomes hard upon drying. Consequently, rainfall is not absorbed and crops are damaged by lack of moisture. The soil is susceptible to flooding during winter.

A large acreage of this soil is idle. Much of the rest is used along with surrounding soils for pasture, and several small, narrow strips have been seeded to sericea lespedeza.

This soil is better suited to hay and pasture crops than to crops that require tillage frequently. (Capability unit IIIe–2; woodland group 3.)

Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded (WvC3).—This soil has lost all of its original friable surface layer through erosion caused by rapid runoff or by the scouring of floodwaters. The present surface layer is yellowish-brown, firm silty clay loam. In many places there are a few pebbles and an occasional gully. In a few areas the soil is moderately eroded and the slope is as much as 12 percent.

This soil is low in fertility and in moisture-supplying capacity. Runoff is rapid, and the hazard of erosion is high. Tilth is poor, and yields are low. The soil is subject to flooding and is likely to be damaged by further erosion.

Most areas of this soil have a cover of weeds, briers, low trees, and shrubs. A small acreage is seeded to sericea lespedeza or is in pasture.

This soil is better suited to pasture and hay crops than to row crops. Tall fescue, whiteclover, and bermudagrass are satisfactory plants for pasture, and sericea lespedeza is satisfactory for hay. (Capability unit IVe–3; woodland group 3.)

Use and Management of the Soils

This section has several parts. The first explains the capability classification used by the Soil Conservation Service. Then management of groups of soils, the capability units, is described. Next the estimated yields of the principal crops under two levels of management are given, along with a discussion of practices for managing the soils. This is followed by a discussion of soil management for woodland, for wildlife, and for engineering.

Capability Groups of Soils

The capability classification is a grouping that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclass is indicated by adding a letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony, and *c* (none in this county) indicates that the chief limitation is a climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it have little or no erosion hazard but have other limitations that limit their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have

similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe-1 or IIIe-2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

The classes, subclasses, and units that are in this county are described in the listing that follows.

Class I.—Soils that have few limitations that restrict their use.

Unit I-1.—Deep, nearly level soils that are on bottom lands, or low terraces, or are along drainageways.

Class II.—Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe.—Soils subject to moderate erosion if they are not protected.

Unit IIe-1.—Deep, well-drained, gently sloping soils that are permeable and medium textured.

Unit IIe-2.—Moderately well drained, gently sloping soils that have a fragipan or other compact layer at a depth of about 2 feet.

Subclass IIw.—Soils that have moderate limitations because of excess water.

Unit IIw-1.—Moderately well drained to somewhat poorly drained, nearly level soils of bottom lands and low terraces.

Unit IIw-2.—Well drained to moderately well drained, level or nearly level soils that have a fragipan or other compact layer at a depth of about 2 feet.

Subclass IIs.—Soils that have moderate limitations of moisture capacity or tilth.

Unit IIs-1.—Well-drained, nearly level, cherty or sandy soils of bottom lands.

Class III.—Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.

Subclass IIIe.—Soils subject to severe erosion if they are cultivated and not protected.

Unit IIIe-1.—Deep, gently sloping and sloping soils that are well drained.

Unit IIIe-2.—Gently sloping and sloping soils that are moderately well drained and have a fragipan or other compact layer at a depth of about 2 feet.

Unit IIIe-3.—Moderately deep, gently sloping and sloping soils that have a clayey subsoil.

Subclass IIIw.—Soils that have severe limitations because of excess water.

Unit IIIw-1.—Somewhat poorly drained soils that have a fragipan at a depth of about 2 feet.

Unit IIIw-2.—Poorly drained, nearly level soils of first bottoms.

Class IV.—Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe.—Soils subject to very severe erosion if they are cultivated and are not protected.

Unit IVe-1.—Moderately deep and deep, sloping and strongly sloping soils that are well drained and medium textured.

Unit IVe-2.—Shallow to deep, sloping and strongly sloping soils that are well drained and have a clayey subsoil.

Unit IVe-3.—Moderately well drained, gently sloping to strongly sloping soils that have a fragipan or other compact layer near the surface.

Subclass IVw.—Soils that have severe limitations for cultivation because of excess water.

Unit IVw-1.—Level or nearly level, poorly drained, gray soils.

Subclass IVs.—Soils that have severe limitations of stoniness, low moisture capacity, or other soil features.

Unit IVs-1.—Well-drained to excessively drained, cherty or gravelly soils that are droughty.

Class V.—Soils that have little or no hazard of erosion but have other limitations impractical to remove that limit their use largely to pasture, range, woodland, or wildlife food and cover. (None in Hardin County.)

Class VI.—Soils that have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass VIe.—Soils severely limited, chiefly by risk of erosion, if protective cover is not maintained.

Unit VIe-1.—Deep, strongly sloping to steep, silty and sandy soils that are well drained.

Unit VIe-2.—Sloping to steep soils that have a clayey or compact subsoil.

Class VII.—Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe.—Soils and landforms that are severely limited, chiefly by risk of erosion, if a protective cover is not maintained.

Unit VIIe-1.—Chiefly steep, sandy or clayey soils and gullied land.

Subclass VIIs.—Soils that are very severely limited by moisture capacity, stones, or other soil features.

Unit VIIs-1.—Chiefly steep soils that are rocky, gravelly, and cherty.

Class VIII.—Soils and landforms that have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or esthetic purposes. (None in Hardin County.)

Management by Capability Units

Soils in one capability unit have about the same limitations and similar risks of damage. The soils in one unit, therefore, need about the same kind of management, though they may have formed from different kinds of parent materials and in different ways. The capability units are described in the following pages. The soils in each unit are listed, and management suitable for all the soils of one unit is suggested.

CAPABILITY UNIT I-1

In this unit are deep, nearly level soils that are on bottom lands, or low terraces, or are along drainageways. Except for the Collins soils, which are moderately well drained, these soils are well drained. In most places slopes range from 0 to 2 percent, but in a few places slopes are as much as 3 percent. Most areas are subject to flooding in winter. Along the tributary streams the floodwaters stay only a few hours, but along the Tennessee River the floodwaters remain for longer periods. The following soils are in this unit:

Collins fine sandy loam.
Collins loam, local alluvium.
Collins silt loam.
Ennis silt loam.
Ennis silt loam, local alluvium.
Ennis fine sandy loam.
Huntington silt loam.
Huntington fine sandy loam.
Sequatchie fine sandy loam, 0 to 2 percent slopes.
Vicksburg loam.
Vicksburg loam, local alluvium.

These soils are moderate to high in natural fertility, are high in moisture-supplying capacity, and are permeable throughout the profile. The soils are neutral to strongly acid. They are friable and are easy to work and conserve. The response to fertilizer is excellent because roots can penetrate the soils deeply and because the supply of moisture is high. The fine sandy loams in this unit are not so high in organic matter as the silt loams.

The acreage of these soils is large, and much of it is used intensively for corn and other grains. Yields of the crops and pasture plants commonly grown, including legumes, are high.

The soils in this unit are suited to all of the crops and pasture plants commonly grown. Cotton also grows well, except in wet years. These soils can be used intensively. Even without fertilizer, these soils give high yields, but they make even better yields if fertilizer is added. Because of their high value for row crops, these soils are not commonly used for pasture, although they are especially valuable for pasture in summer because they produce good yields of forage when pastures on the uplands are dry. If row crops are grown continuously, turning under crop residues will help to supply organic matter and to maintain good tilth.

CAPABILITY UNIT IIe-1

In this unit are deep, well-drained, gently sloping soils that are permeable and medium textured. The Dexter, Humphreys, and Sequatchie soils are on intermediate and low terraces, but the Pickwick, Silerton, and Waynesboro soils occupy smooth areas on the caps of low hills. The soils of this group are friable in the surface layer and subsoil. Their surface layer ranges from silt loam to fine sandy loam in texture. The subsoil is mostly clay loam and silty clay loam. Generally some areas, particularly areas of the Sequatchie soil, are flooded in winter for several days. The following soils are in this unit:

Dexter loam, 2 to 5 percent slopes, eroded.
Humphreys silt loam, 2 to 5 percent slopes, eroded.
Humphreys cherty silt loam, 2 to 5 percent slopes, eroded.
Pickwick silt loam, 2 to 5 percent slopes.
Pickwick silt loam, 2 to 5 percent slopes, eroded.
Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded.
Silerton silt loam, 2 to 5 percent slopes.
Silerton silt loam, 2 to 5 percent slopes, eroded.
Waynesboro fine sandy loam, 2 to 5 percent slopes.

These soils are moderately low to moderately high in natural fertility. They are moderately high to high in moisture-supplying capacity. The soils range from medium acid to strongly acid, but most of them are strongly acid. Plant roots can penetrate these soils easily. The soils are easy to work and keep in good tilth, and they are fairly easy to conserve.

About 40 percent of the acreage of these soils is in crops. The rest is idle, is already in trees, or is reverting to trees.

These soils are suitable for moderately intensive use. They are well suited to cotton, corn, small grains, and hay crops. Yields of alfalfa are fair to good. The soils are also suited to such other legumes and grasses as white clover, red clover, button clover, vetch, lespedeza, tall fescue, orchardgrass, and ryegrass. Lime and a complete fertilizer are required for high yields of all crops, and the response of most crops is good enough to justify adding large amounts. If the soils are well managed, control of water is not difficult and the risk of erosion is slight.

When the soils are farmed on the contour, a suitable cropping system is 2 years of grasses and 1 year each of cotton and a small grain. If contour stripcropping is used, a suitable cropping system is 2 years of grasses and legumes grown for hay and pasture and 2 years of cotton or some other row crop.

CAPABILITY UNIT IIe-2

The soils in this unit are moderately well drained, gently sloping soils that have a fragipan or other compact layer at a depth of about 2 feet. These soils are on the caps of low hills and on broad areas on low terraces. Most of the soils have a surface layer that is about 5 to 8 inches thick. The subsoil is silt loam, silty clay loam, or clay loam. The areas on the low terraces are flooded occasionally, and the floodwaters stay longer on areas along the Tennessee River than on areas along the smaller streams. The following soils are in this unit:

Captina silt loam, 2 to 5 percent slopes, eroded.
Dulac silt loam, 2 to 5 percent slopes.
Dulac silt loam, 2 to 5 percent slopes, eroded.
Freeland loam, 2 to 5 percent slopes, eroded.
Paden silt loam, 2 to 5 percent slopes.
Paden silt loam, 2 to 5 percent slopes, eroded.
Wolftever silt loam, 2 to 5 percent slopes.
Wolftever silt loam, 2 to 5 percent slopes, eroded.

These soils are friable and permeable in the upper 2 feet, but the compact lower subsoil causes them to be poorly aerated below that depth. Also, water moves slowly through the compact layer, and as a result, the lower subsoil is waterlogged during wet seasons. For most plants, the root zone is restricted to the upper 2 feet.

These soils are moderately low in fertility and in moisture-supplying capacity. They are strongly acid. The soils are easy to work and to maintain and are easy to keep in good tilth. Slopes are mild, and control of erosion is only a moderate problem.

About 25 percent of the acreage of these soils is in trees. The rest is mainly in crops and pastures, but some is idle.

These soils are fairly well suited to most of the crops commonly grown. Cotton, grain sorghum, small grains, and soybeans make good yields if well fertilized. Orchardgrass, tall fescue, bermudagrass, ryegrass, red clover, white

clover, and lespedeza are suitable for pasture and hay. Yields of corn generally are moderate, except in wet years, when high yields can be obtained. In most places alfalfa grows well for about 2 years. It then fails because of wetness of the lower subsoil in winter. In some places stands of alfalfa last for 3 or 4 years.

These soils are not suitable for intensive tillage. Slopes are mild, but much soil material is likely to be lost through erosion if these soils are cultivated several years in a row. These soils should be in close-growing crops about 2 years out of 4. If they are farmed on the contour, a suitable cropping system is 2 years of grasses and legumes and 1 year each of cotton and a small grain.

The soils in this unit are low in all of the essential elements. Lime and a complete fertilizer are required, and they should be applied according to needs indicated by soil tests. Fairly large amounts of fertilizer are needed for good yields, and the response to fertilizer and other management is good. The supply of moisture is not high enough in these soils, however, to justify adding large amounts of fertilizer.

CAPABILITY UNIT IIw-1

In this unit are moderately well drained to somewhat poorly drained, nearly level soils of bottom lands and low terraces. These soils are on flood plains of the Tennessee River and of many other streams throughout the county. The Beason soil is on low terraces, but the other soils are on bottom lands. Some of the soils are in slightly depressed areas. In most places the texture of the surface layer and subsoil is silt loam or fine sandy loam, but in a few places it is silty clay loam. Nearly all areas of these soils are subject to flooding. The floodwaters remain from a few hours to several days. The following soils are in this unit:

Beason silt loam.
Falaya silt loam.
Falaya loam, local alluvium.
Lindside silt loam.
Lindside silty clay loam.
Lobelville silt loam.
Lobelville cherty silt loam.
Mantachie fine sandy loam.

Falaya loam, local alluvium, is less likely to be flooded than the other soils in this unit, but it receives much seepage water from the uplands. In a few places the Lobelville soils are cherty, but the chert does not prevent tillage. The water table in the soils of this unit moves up and down as the seasons change. In wet seasons the water table may rise to within a few inches of the surface; in the drier parts of the year, the water table may drop to as much as 5 feet or more below the surface.

These soils are moderately low to high in fertility and are moderately high to high in moisture-supplying capacity. They are slightly acid to strongly acid. Most of the soils are medium textured and are easy to work. They are often too wet to work, however, early in spring. Dates of planting are delayed frequently. These soils respond well to fertilizer. Except in those areas where scouring by floodwaters occurs, the soils are easy to conserve.

Much of the acreage of these soils is used for crops, even though occasional flooding limits the number of crops that can be grown. All of the soils are suited to corn, grain sorghum, soybeans, tall fescue, whiteclover, and annual lespedeza. Orchardgrass grows well on the better drained areas of Beason, Lindside, and Lobelville soils. Generally, all of the soils are too wet for alfalfa. Cotton grows well on areas that are drained adequately, but in most places the risk of flooding is too severe for cotton. Lobelville cherty silt loam is suited to the same crops as the other soils, but yields are less because the chert causes the soil to hold less moisture. The soils of this unit remain moist when soils of the uplands are dry. Therefore, they are especially valuable for summer grazing.

If adequate amounts of fertilizer are added and other good management is used, these soils can be used continuously for row crops. Turning under large amounts of crop residues will help supply organic matter and help maintain good tilth. Artificial drainage will increase yields of many crops and also will increase the number of crops that can be grown. All of these soils are low in phosphorus. Moderate amounts of potash and large amounts of nitrogen are required for most crops. Most areas need lime, but some are naturally well supplied with lime. Consequently, the soils should be tested before lime is applied.

CAPABILITY UNIT IIw-2

In this unit are well drained or moderately well drained, level or nearly level soils that have a fragipan or other compact layer at a depth of about 2 feet. Except for the Egam soil, which generally lies between first bottoms and low terraces, the soils are on low terraces. The surface layer of these soils is friable and is between 6 and 10 inches thick. The subsoil is mainly silty clay loam that becomes mottled and is dense or brittle at a depth of about 2 feet. Nearly all areas of these soils are subject to flooding, mainly in winter. The floodwaters remain on the areas from a few hours to a few days. The following soils are in this unit:

Captina silt loam, 0 to 2 percent slopes.
Egam silty clay loam.
Wolftever silt loam, 0 to 2 percent slopes.

These soils are moderately low to moderately high in fertility, organic matter, and moisture-supplying capacity. They are slightly acid to strongly acid. The soils are fairly easy to work, but they are likely to be somewhat cloddy, especially the Egam soil. On all of the soils, dates of planting may be delayed because of wetness in spring. Except in those areas where scouring by floodwaters occurs, the soils are easy to conserve.

Most of the acreage of these soils is used for crops, although the number of crops that can be grown is limited by slow drainage of the lower subsoil and risk of flooding. Corn, grain sorghum, soybeans and lespedeza are well suited. Small grains grow well, but the risk of losing the crop by flooding is high. Cotton is not well suited. The risk of flooding and coolness of the soils in spring makes it difficult to get a good stand. Tall fescue and whiteclover grow well, but their use in the cropping system depends on whether cattle are raised on a particular farm.

These soils are suited to moderately intensive use because they are easy to maintain. They probably could be cultivated more intensively if large amounts of crop residues were turned under to help supply organic matter and to improve tilth. Crops should be selected that are not likely to be damaged by floods and that grow well on soils that are moderately well drained. These soils require lime and a complete fertilizer if moderate to moderately

high yields are to be obtained. The response is good enough to justify adding large amounts.

CAPABILITY UNIT IIs-1

In this group are well drained, nearly level, cherty or very sandy soils of bottom lands. Many of the areas are flooded for short periods in winter and spring. The following soils are in this unit:

Bruno loamy fine sand.
Ennis cherty silt loam.
Ennis cherty silt loam, local alluvium.

These soils are moderately low to moderately high in natural fertility. Their moisture-supplying capacity is moderately low because of the coarse texture or numerous fragments of chert. These soils are medium acid to strongly acid. They are easy to work and maintain. The fragments of chert are small and do not prevent cultivation. The Bruno soil is more droughty than the Ennis soils.

The soils in this unit are used mainly for corn, cotton, and lespedeza. The Bruno soil is in small areas and is not important for agriculture, but the Ennis soils are important to agriculture, even though their total acreage is fairly small.

In general, the soils of this unit are suited to cultivated crops, hay crops, pasture plants, and trees. They are moderately productive and can be cultivated every year. Many of the areas, however, are flooded occasionally, and such crops as small grains and alfalfa, or even cotton, may be lost.

All of the crops commonly grown make good yields on the Ennis soils, but on the Bruno soil yields are generally low. The Bruno soil is probably better suited to crops that mature early than to other crops. The response of the Ennis soils to fertilizer and to other management is moderate to moderately high. Therefore, it would pay to add moderately large amounts of fertilizer to those soils. The Bruno soil is too sandy to hold much moisture, and its response to fertilizer and other management is low. Thus, adding large amounts of fertilizer to the Bruno soil is not justified.

CAPABILITY UNIT IIIe-1

In this unit are deep, gently sloping and sloping soils that are well drained. These soils are on uplands and stream terraces. In areas that are not eroded, the surface layer is friable fine sandy loam to silt loam; the subsoil is silty clay loam or clay loam. In areas that are severely eroded, the surface layer and subsoil are silty clay loam to clay loam. In the Minvale and Etowah soils, and in some of the Waynesboro soils, the surface layer and subsoil are cherty or gravelly. The chert and gravel do not prevent tillage or limit the number of crops that can be grown. Yields of most crops are lower than for the other soils in this unit, however, because of the lower supply of moisture. The following soils are in this unit:

Brandon silt loam, 5 to 8 percent slopes.
Culleoka silt loam, 5 to 12 percent slopes.
Dexter loam, 5 to 8 percent slopes, eroded.
Dexter clay loam, 2 to 5 percent slopes, severely eroded.
Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded.
Magnolia fine sandy loam, 5 to 8 percent slopes.
Minvale cherty silt loam, 5 to 12 percent slopes.
Mountview silt loam, 5 to 8 percent slopes.
Pickwick silt loam, 5 to 8 percent slopes.
Pickwick silt loam, 5 to 8 percent slopes, eroded.
Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded.
Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded.
Ruston fine sandy loam, 5 to 8 percent slopes.
Sequatchie loam, 2 to 8 percent slopes, severely eroded.
Silerton silt loam, 5 to 8 percent slopes.
Silerton silt loam, 5 to 8 percent slopes, eroded.
Silerton silty clay loam, 2 to 5 percent slopes, severely eroded.
Waynesboro fine sandy loam, 5 to 8 percent slopes.
Waynesboro clay loam, 2 to 5 percent slopes, severely eroded.
Waynesboro gravelly sandy loam, 5 to 8 percent slopes.
Waynesboro gravelly sandy loam, 8 to 12 percent slopes.

These soils are moderate to low in natural fertility, and they are moderately low to moderately high in moisture-supplying capacity. They are medium acid to very strongly acid. These soils are easy to work. Except for areas that are severely eroded or are cherty or gravelly, tilth is good.

About 50 percent of the acreage is in trees. Most of the rest is in crops and pastures, but some is idle. Many homesites are on soils of this unit, particularly on the Pickwick soils. Cotton, corn, and annual lespedeza are the main crops.

These sloping soils are not suited to intensive cultivation, but a wide variety of crops can be grown if medium to long cropping systems are used. Corn, cotton, and other row crops make good yields. Alfalfa is well suited, and all of the other common legumes and grasses can be grown. These soils are good for pasture. They can be grazed throughout most of the year since they are in the uplands where drainage is good.

Because of the fairly strong slopes, it is necessary to keep these soils in close-growing grasses and legumes most of the time. When the soils are farmed on the contour, a suitable cropping system is 1 year of a row crop followed by a small grain and then 3 or 4 years of grasses and legumes grown for hay and pasture. If stripcropping is used, a suitable cropping system is 1 year of row crops followed by 2 years of grasses and legumes grown for hay and pasture. Terracing will help to control erosion. It is especially effective on these soils because the slopes are long.

These soils respond well to fertilizer and to other management. All of the soils are low in lime, phosphorus, potassium, and nitrogen and require moderately large amounts of these elements for good yields. The response is good enough to justify adding the fertilizer.

CAPABILITY UNIT IIIe-2

In this unit are gently sloping and sloping soils that are moderately well drained and have a fragipan or other compact layer at a depth between 15 and 24 inches. These soils are on the caps of low hills or are on broad, low terraces. In areas that are not eroded, the fragipan or other compact layer is normally at a depth of about 2 feet, but in places that are severely eroded it is close to the surface. The surface layer, in areas that are not severely eroded, is friable silt loam or loam that is about 6 to 8 inches thick. The subsoil is silt loam, silty clay loam, or clay loam that extends to the compact layer. In severely eroded areas the surface layer is similar to the subsoil. The following soils are in this unit:

Dulac silt loam, 2 to 5 percent slopes, severely eroded.
Dulac silt loam, 5 to 8 percent slopes.

Freeland loam, 2 to 5 percent slopes, severely eroded.
Freeland loam, 5 to 8 percent slopes, eroded.
Paden silt loam, 2 to 5 percent slopes, severely eroded.
Paden silt loam, 5 to 8 percent slopes.
Paden silt loam, 5 to 8 percent slopes, eroded.
Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded.

These soils are moderately low to low in moisture-supplying capacity and are low in fertility. They are strongly acid. The soils are permeable above the compact layer, but below that depth they are very slowly permeable. Plant roots are confined mostly to the soil above the compact layer, which is the uppermost 24 inches or less. Tilth is good in areas that are not severely eroded, and the soils are easy to work. In the severely eroded areas, tilth is fair.

The soils in this unit are used for crops, pasture, and trees. The main crops are cotton, corn, and annual lespedeza. Much of the acreage of the severely eroded areas is idle or is in unimproved pasture.

These soils produce fair to good yields of cotton, corn, and other row crops. The supply of moisture is not sufficient for corn to make consistently high yields, but moderate yields can be made. The soils are well suited to small grains because they grow when moisture is most plentiful. They are also well suited to most hay and pasture plants. Alfalfa is not well suited. Wetness of the lower subsoil generally limits the productive life of the stand to about 2 years. Other legumes and grasses grow well if fertilizer is added.

These soils erode easily when not protected. Consequently, they are not suitable for frequent cultivation. A suitable cropping system is a row crop followed by 3 or 4 years of grasses and legumes grown for hay and pasture. If contour stripcropping is used, a suitable cropping system is 2 years of small grain followed by 2 years of grasses and legumes grown for hay and pasture.

The soils in this unit are very low in lime, phosphorus, potassium, and nitrogen, and they require all of these elements to produce profitable yields. Fair to good yields of suitable crops can be grown if moderate amounts of fertilizer are applied and other good management is used. The response is moderate to moderately high, but the supply of moisture is too low to justify adding large amounts of fertilizer. In areas where erosion has caused the compact layer to be near the surface, deep tillage will help increase the depth of permeable material and thus increase the supply of moisture in the soils.

CAPABILITY UNIT IIIe-3

In this unit are moderately deep, gently sloping to sloping soils that have a clayey subsoil. These soils are on uplands. Slopes range between 2 and 8 percent, but they are dominantly between 5 and 8 percent. The surface layer of these soils is silt loam or fine sandy loam that is about 5 to 8 inches thick. The fine-textured subsoil ranges from sandy clay to clay. The lower subsoil or substratum is underlain by limestone bedrock or stratified sand and clay of the Coastal Plain. The following soils are in this unit:

Boswell fine sandy loam, 2 to 8 percent slopes.
Shubuta fine sandy loam, 5 to 8 percent slopes.
Shubuta fine sandy loam, 5 to 8 percent slopes, eroded.
Talbott silt loam, 2 to 5 percent slopes.
Talbott silt loam, 5 to 8 percent slopes.

These soils are low in natural fertility and are moderately low in moisture-supplying capacity. They are medium acid to strongly acid. Plant roots penetrate the surface layer easily, but they penetrate the firm subsoil slowly. Except for a few areas of the Talbott soils where limestone crops out, tilth is fairly good. These soils are very erodible. They are hard to cultivate in areas that are severely eroded because their clayey subsoil is near the surface.

Most of the acreage of these soils is in cutover forest. Areas that are cleared consist mainly of the Shubuta soils. These are used mostly for cotton and hay crops, but a few areas are in unimproved pasture.

Row crops make only moderate yields on these soils because of the lack of moisture and because roots penetrate the soils slowly. The soils are suited to small grains and to all hay and pasture plants. Yields of pasture are good if the soils are well fertilized and other good management is used. In summer, however, pasture plants generally make little growth.

These soils are not suited to frequent cultivation. If they are used for row crops, contour farming, terracing, or stripcropping is needed to help control erosion. Small grains are more profitable than row crops in the cropping system because they grow when moisture is most plentiful. A suitable cropping system is 1 year of small grains followed by 3 or more years of grasses and legumes grown for hay and pasture.

All of the soils are low in essential elements. Moderate to moderately large amounts of lime and a complete fertilizer are required for profitable yields of all crops. The response to fertilizer and to other good management, however, is only moderate to moderately low. The supply of moisture probably is not sufficient to justify adding large amounts of fertilizer.

CAPABILITY UNIT IIIw-1

The soils in this unit are somewhat poorly drained and have a fragipan at a depth of about 2 feet. They are on low terraces or upland flats where they occupy nearly level or depressed areas. Slopes are generally less than 4 percent. The surface layer is highly leached, friable loam or silt loam that is about 8 inches thick. The subsoil is mottled gray and brown, dense silty clay loam or silt loam. The following soils are in this unit:

Hatchie loam.
Taft silt loam.

These soils contain little organic matter and are low in fertility. They are strongly acid. The strong mottling and gray color of the subsoil indicate that it is saturated with water part of the year. The subsoil is slowly permeable to plant roots. As a result, root systems cannot develop rapidly or extensively. The supply of moisture is erratic. In wet seasons the soils are wet, and in places water is ponded on them. In summer, however, they are fairly dry. There is little pore space in the subsoil, and its capacity to absorb and hold water available to plants is low. Rainfall and runoff from upland areas drains away slowly, and the surface is wet in winter and spring.

Nearly all of the acreage of these soils is cleared. About half in is unimproved pasture, and the rest is used mainly for soybeans, grain sorghum, corn, and hay crops.

These soils are poorly suited to cotton, small grains, deep-rooted legumes, and vegetable crops. They are better

suited to soybeans, grain sorghum, white clover, alsike clover, tall fescue, redtop, and other crops that tolerate wetness. Lespedeza makes fair to good yields, and corn makes fair yields. It is often difficult, however, to get a good stand of corn.

A complete fertilizer is required for good yields of all crops on these soils. The response to fertilizer is only moderate, and it is not consistent because of the erratic supply of moisture.

If these soils could be drained, most of the common crops could be grown. Furthermore, the soils could be used intensively because they are nearly level and the hazard of erosion is slight. Artificial drainage, however, is not feasible in some areas, because suitable outlets for water are lacking. Also, the cost of draining these areas is higher than that of draining bottom lands. The slow lateral movement of water requires close spacing of drains. The need for additional areas for cultivated crops on a particular farm and the kind of farming done will determine if the cost of draining is justified.

CAPABILITY UNIT IIIw-2

In this unit are poorly drained, nearly level soils of first bottoms. The surface layer is mostly silt loam or fine sandy loam that is about 8 inches thick. It is underlain by gray silt loam to silty clay loam. In some places there are many fragments of chert in the soils and on the surface. Most areas are likely to be flooded occasionally. The floodwaters remain from a few hours to 2 weeks. The following soils are in this unit:

- Dunning silty clay loam.
- Lee silt loam.
- Lee cherty silt loam.
- Melvin and Newark silt loams.
- Waverly silt loam.
- Waverly fine sandy loam.

These soils are moderately low to moderately high in fertility. They are strongly acid to slightly acid. Runoff and internal drainage are slow. The water table fluctuates and is at or near the surface during periods of high rainfall. Also, much seepage water flows onto these soils from adjacent areas on uplands. The soils, therefore, are too wet to be tilled during much of the year. The subsoil is permeable, however, and movement of water through this layer is medium to rapid when the water table drops.

About 60 percent of the acreage of these soils is still in trees. The largest acreage of trees is on the Waverly soils. About 30 percent of this unit is used for cultivated crops, mainly corn, soybeans, and grain sorghum. The rest is idle.

These soils are poorly suited to many crops, unless they are artificially drained. They are well suited to tall fescue, whiteclover, and other plants that tolerate wetness. In the drier seasons, corn makes fair to good yields, but the risk of failure of the crop is high. Soybeans and grain sorghum grow well, but they are also likely to fail because of wetness and flooding. Because of the large amount of moisture, these soils are highly productive of pasture plants for summer grazing.

If these soils were drained and adequate amounts of fertilizer were added, high yields of many plants could be obtained. Furthermore, the soils could be used intensively because they are nearly level and are not likely to erode.

CAPABILITY UNIT IVe-1

In this unit are moderately deep and deep, sloping and strongly sloping soils that are well drained and medium textured. These soils are on uplands and terraces. In areas that are not severely eroded, the surface layer is mainly silt loam or fine sandy loam, and the subsoil is silty clay loam or clay loam. In areas that are severely eroded, the surface layer and subsoil have about the same texture. The following soils are in this unit:

- Brandon silt loam, 8 to 12 percent slopes.
- Dexter loam, 8 to 12 percent slopes.
- Dexter clay loam, 5 to 8 percent slopes, severely eroded.
- Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded.
- Magnolia fine sandy loam, 8 to 12 percent slopes.
- Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded.
- Pickwick silt loam, 8 to 12 percent slopes.
- Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded.
- Ruston fine sandy loam, 8 to 12 percent slopes.
- Silerton silt loam, 8 to 12 percent slopes.
- Silerton silty clay loam, 5 to 8 percent slopes, severely eroded.
- Waynesboro fine sandy loam, 8 to 12 percent slopes.
- Waynesboro clay loam, 5 to 8 percent slopes, severely eroded.
- Waynesboro clay loam, 8 to 12 percent slopes, severely eroded.
- Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded.

These soils are low to moderately low in natural fertility, and they are moderately low in moisture-supplying capacity. They are medium acid to strongly acid. Tilth is good in areas that are not severely eroded, and there the soils are easy to work. In the areas that are severely eroded, tilth is only fair because there is much clay in the surface layer. In some places there is much chert or gravel in the soils. Here, the soils are more difficult to work and have lower moisture-supplying capacity. Because all of these soils have strong slopes and a silty surface layer, they erode rapidly if they are cultivated.

About 55 percent of the acreage of these soils is in cutover forests of hardwoods and pines. The rest is used mostly for corn, cotton, and annual lespedeza.

These soils are better suited to alfalfa, other deep-rooted legumes, and pasture crops than to row crops. Good pastures can be established if the soils are well fertilized. The supply of moisture is not sufficient for corn to make consistently high yields, but it is sufficient for corn to make fair to good yields. Small grains on these soils make good yields because they grow when the supply of moisture is most plentiful.

The soils are not suitable for frequent cultivation. Although all of the common crops can be grown, close-growing grasses and legumes should be kept on the soils at least 3 years out of 4. Stripcropping will help to maintain the soils and will also help crops grown on them make effective use of soil moisture. These soils require large amounts of lime, nitrogen, phosphorus, and potash for good yields of crop and pastures. The response to fertilizer and to other management is good.

CAPABILITY UNIT IVe-2

This unit consists of shallow to deep, sloping and strongly sloping soils that are well drained and have a clayey subsoil. These soils are on ridgetops. Slopes are moderately short. Some of the soils developed in material from limestone, and others developed in coastal plain sandy clay or clay. The soils that developed in material

from limestone are underlain by limestone bedrock at a depth between 3 and 10 feet. The coastal plain soils are deeper and are underlain by sandy clay and clay. In areas that are not severely eroded, the surface layer is loam and is 5 to 7 inches thick, and the subsoil is mainly clay or sandy clay. The surface layer in areas that are severely eroded is clayey. The following soils are in this unit:

Boswell silty clay, 2 to 8 percent slopes, severely eroded.
Colbert silty clay loam, 5 to 12 percent slopes.
Dandridge-Needmore complex, 8 to 12 percent slopes.
Shubuta clay loam, 5 to 8 percent slopes, severely eroded.
Shubuta fine sandy loam, 8 to 12 percent slopes.
Talbott silt loam, 8 to 12 percent slopes.
Talbott cherty silt loam, 5 to 12 percent slopes.

These soils are low in fertility. They are moderately low to low in moisture-supplying capacity and are fairly droughty. Except for soils of the Dandridge-Needmore complex, which are nearly neutral to strongly acid, these soils are strongly acid. In areas that are not severely eroded, the soils are fairly easy to work. Tilth is poor in the areas that are eroded because the clayey subsoil is at the surface. Because of the clayey subsoil, roots of plants grown in summer cannot penetrate deeply to reach the moisture that is available.

About 50 percent of the acreage of these soils is in cutover trees. The rest is in crops, in unimproved pasture, or idle. Cotton, corn, and annual lespedeza are the main crops.

Normally, the supply of moisture is not sufficient for corn, cotton, and other row crops to make good yields, even if large amounts of fertilizer are added. Consequently, it does not pay to add more than moderate amounts of fertilizer for these crops. Cotton will probably make somewhat better yields than corn. Small grains, hay crops, and pasture plants make higher yields than row crops. They grow when moisture is most plentiful, and it will pay to add large amounts of fertilizer for these crops. Alfalfa grows well, but it requires fairly large amounts of fertilizer.

These soils erode readily if cultivated. They should not be used for row crops more often than once every 4 or 5 years. If feasible, a small grain should be used in the cropping system rather than a row crop.

All of the soils are low in lime, nitrogen, phosphorus, and potassium, and all of these elements are needed for profitable yields. Stripcropping the longer slopes will help to control erosion and to conserve moisture. Also, it will make it feasible to use the soils more intensively.

CAPABILITY UNIT IVe-3

In this unit are moderately well drained, gently sloping to strongly sloping soils that have a fragipan or other compact layer near the surface. These soils are on low terraces and on the caps of low, irregular hills. Some of them developed in loess, and others developed in alluvium and colluvium. Most areas are severely eroded, and the fragipan or compact layer is likely to be within a few inches of the surface, or, if erosion has been less severe, it may be as deep down as 24 inches. The texture of the surface layer and subsoil ranges from loam to silty clay loam. The soils are likely to be flooded for short periods in winter and spring, particularly the Captina and Wolftever soils. The following soils are in this unit:

Captina silty clay loam, 2 to 8 percent slopes, severely eroded.
Dulac silt loam, 5 to 8 percent slopes, severely eroded.
Freeland loam, 5 to 8 percent slopes, severely eroded.
Landisburg cherty silt loam, 5 to 12 percent slopes, eroded.
Paden silt loam, 5 to 8 percent slopes, severely eroded.
Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded.

These soils are moderately low to low in fertility. They are medium acid to strongly acid. Permeability is slow, and in many places there is a perched water table above the fragipan or compact layer. In places where this layer is at a depth of 2 feet, the uppermost 18 to 20 inches of the soil is permeable and is well aerated. In areas where the fragipan or compact layer is below the plow layer, the soils have good tilth and are easy to work; the layer itself is difficult to work because it is hard and cloddy when dry. All of the soils are fairly droughty. Response to fertilizer and to other good management is moderate.

Much of the acreage of these soils is idle. Only a small part is used for crops and pasture, mainly cotton and lespedeza.

These soils are poorly suited to summer annual crops, chiefly because of shallowness of the root zone. In areas where the fragipan or compact layer is near the surface, roots of plants cannot penetrate the soil deeply enough to obtain a good supply of moisture. Therefore, the plants grow little, even if periods of drought are short. Alfalfa is also poorly suited because the soils are not drained well enough. Yields of all other crops are fair.

These soils are too sloping to be cultivated frequently. If they are cultivated, a cropping system is needed in which sod crops are grown most of the time. Small grains and legumes grown for hay or pasture are probably better suited than row crops. Moderate amounts of lime and a complete fertilizer are needed for profitable yields. It probably would not pay to add large amounts of fertilizer; the root zone is too shallow for plants to make full use of it.

CAPABILITY UNIT IVw-1

In this unit are level or nearly level, poorly drained, gray soils. These soils are on upland flats or on flood plains of the larger streams. The surface layer is light colored, is silty, and is about 8 inches thick. The subsoil consists dominantly of gray, dense silty clay loam. The water table is close to the surface in winter and in spring, but it drops to several feet below the surface in summer and in fall. Some of the areas are slightly depressed and are ponded for short periods in wet seasons. The areas on flood plains are flooded for short periods in winter and in spring. The following soils are in this unit:

Almo silt loam.
Robertsville silt loam.

These soils are low in fertility. They are strongly acid. The supply of moisture is erratic. Generally, these soils are wet in winter and spring but are dry and droughty in summer. The soils have little pore space and do not hold much water.

About 50 percent of the acreage of these soils is cleared, but only a small part is used for corn or for hay crops. The areas are used mainly for native pasture, although a few acres are in improved pastures. Lespedeza is the crop most commonly grown for hay or pasture.

Under natural drainage these soils are poorly suited to many of the crops commonly grown. They are better

suited to soybeans, grain sorghum, white clover, alsike clover, tall fescue, and other crops that tolerate wetness than they are to many crops. Corn makes low yields, and small grains are lost because of excess water. Lespedeza makes fair stands of hay or pasture if it is planted in areas that do not have water ponded on them late in spring.

Large amounts of fertilizer are required for good yields of all plants. In areas where the soils are not drained, plants that tolerate wetness respond moderately well if adequate amounts of fertilizer are added. In dry periods, however, the supply of moisture is erratic and the response to fertilizer is low. Plants, therefore, grow little.

If these soils could be drained, most of the common crops could be grown. Furthermore, the soils could be used intensively for crops because they are nearly level and the hazard of erosion is slight. Artificial drainage is not feasible in some areas because of the lack of suitable outlets for the water. Also, the cost of draining the areas is higher than that of draining bottom lands because of the slow lateral movement of water and the need for spacing the drains closely. The need for additional areas for crops on a particular farm will determine if the cost of draining is justified.

CAPABILITY UNIT IVs-1

In this unit are well drained to excessively drained, cherty or gravelly soils that are droughty. These soils are mainly on the upper parts of fairly high hills or ridges. Many fragments of gravel or chert occur throughout the profile. In some places beds of chert or gravel are near the surface. The following soils are in this unit:

Bodine cherty silt loam, 5 to 12 percent slopes.
Saffell gravelly sandy loam, 5 to 12 percent slopes.
Waynesboro very gravelly sandy loam, 5 to 12 percent slopes.

These soils are low in fertility and are strongly acid. They are very droughty because they are too gravelly, too cherty, or too shallow to hold much water. The chert and gravel also make the soils fairly difficult to work. Response to fertilizer is moderately low.

Most of the acreage of these soils is in forests of cutover hardwoods and pines. Only a small acreage is cleared, and it is mostly in unimproved pasture.

These droughty soils are better suited to small grains and to hay and pasture plants that tolerate drought than they are to row crops. Row crops make poor yields. In many places the soils are probably better suited to trees than to other kinds of plants. Small grains require large amounts of fertilizer to produce fair to good yields. If the soils are used for pasture or hay, tall fescue, bermudagrass, ryegrass, whiteclover, and other plants that tolerate drought should be selected. Orchardgrass and alfalfa are poorly suited.

The soils are low in nitrogen, phosphorus, potassium, and lime. Moderate amounts of these elements are needed for good yields of suitable plants. Pines grow fairly well on these soils and can be planted on areas that are to be reforested.

CAPABILITY UNIT VIe-1

This unit consists of deep, strongly sloping to steep, silty and sandy soils that are well drained. These upland soils developed from coastal plain materials, loess, old alluvium, and other kinds of materials. In areas that are severely eroded, the surface layer is mainly silt loam or fine sandy loam, and the subsoil is silty clay loam, clay loam, or sandy clay loam. Where the soils have been severely eroded, the surface layer and subsoil are about the same. The following soils are in this unit:

Culleoka silt loam, 12 to 35 percent slopes.
Dexter clay loam, 8 to 12 percent slopes, severely eroded.
Magnolia fine sandy loam, 12 to 25 percent slopes.
Minvale cherty silt loam, 12 to 25 percent slopes.
Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded.
Pickwick silt loam, 12 to 25 percent slopes.
Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded.
Pickwick-gullied land complex.
Ruston fine sandy loam, 12 to 25 percent slopes.
Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded.
Silerton silty clay loam, 8 to 12 percent slopes, severely eroded.
Waynesboro fine sandy loam, 12 to 35 percent slopes.
Waynesboro clay loam, 12 to 35 percent slopes, severely eroded.
Waynesboro gravelly sandy loam, 12 to 25 percent slopes.
Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded.

These soils are low in fertility, moderate to moderately low in moisture-supplying capacity, and strongly acid. Because of strong slopes, runoff is fairly rapid, and the soils are slightly droughty. The silt loams and fine sandy loams have good tilth and are easy to work. The cherty or gravelly soils and the severely eroded soils, on the other hand, are in fair tilth and are not so easy to work as the others.

Most of the acreage is in forests of cutover trees. The acreage that is cleared is used mostly for pasture or is idle. Only a small acreage is in crops.

These soils are generally too steep for crops, although the less steep areas could be used for crops if contour stripcropping were practiced. The soils are likely to erode if cultivated. Therefore, they are probably better suited to pasture or trees than to row crops. The pasture plants and trees would be more profitable to grow, considering that the supply of moisture in the soils is limited. Orchardgrass, tall fescue, ryegrass, bermudagrass, and whiteclover are suitable pasture plants. Loblolly pines are suitable trees.

Because of rapid runoff, the hazard of erosion is high when pasture is being established. Where the slopes are long, it is best to use contour strips and to establish the pasture over a 2-year period. The soils are naturally low in lime, nitrogen, phosphorus, and potassium, and these elements are generally required if crops are to make profitable yields.

CAPABILITY UNIT VIe-2

The soils in this unit are sloping to steep and have a clayey or compact subsoil. In many places the soils are cut by shallow gullies, and in a few places the gullies are deep. The following soils are in this unit:

Boswell silty clay, 8 to 12 percent slopes, severely eroded.
Boswell fine sandy loam, 8 to 12 percent slopes.
Colbert silty clay loam, 12 to 25 percent slopes.
Cuthbert and Susquehanna soils, 5 to 12 percent slopes.
Dandridge-Needmore complex, 12 to 35 percent slopes.
Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded.
Landisburg cherty silt loam, 12 to 20 percent slopes.
Paden-gullied land complex.
Shubuta clay loam, 8 to 12 percent slopes, severely eroded.
Shubuta fine sandy loam, 12 to 25 percent slopes.
Sumter silty clay, 5 to 12 percent slopes, eroded.
Sumter silty clay, 12 to 35 percent slopes, eroded.
Talbott silty clay, 5 to 8 percent slopes, severely eroded.

Talbott silty clay, 8 to 25 percent slopes, severely eroded.
Talbott silt loam, 12 to 25 percent slopes.
Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded.
Talbott cherty silt loam, 12 to 25 percent slopes.
Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded.

Except for soils of the Dandridge-Needmore complex and the Sumter soils, the soils in this unit are low in fertility, low in organic matter, and strongly acid. The Dandridge-Needmore soils are moderate in fertility and are slightly acid; Sumter soils are high in fertility and are neutral to mildly alkaline. All of the soils are low in moisture-supplying capacity. Response to fertilizer and to other management is low.

About 90 percent of the acreage of these soils is in trees. The rest is used mainly for unimproved pastures. Only a few areas are in row crops. Lespedeza is the most common pasture plant.

These soils erode readily if cultivated and are poorly suited to row crops. Fair pastures can be established and maintained if large amounts of lime and fertilizer are added. Tall fescue, sericea lespedeza, bermudagrass, and all of the pasture plants that resist drought can be grown.

Except for preparing areas for reseeding, plowing should not be done. If pastures are to be established, erosion can be reduced by tilling on the contour and stripcropping long slopes over a period of 2 years. These practices will also help to lessen the risk of failure in establishing a pasture, since some of the pasture plants are likely to be damaged by water running rapidly over the areas.

CAPABILITY UNIT VIIe-1

This unit consists chiefly of steep, sandy or clayey soils and gullied land. There are numerous gullies in some areas. The following soils are in this unit:

Boswell soils, 12 to 25 percent slopes, eroded.
Cuthbert fine sandy loam, 12 to 25 percent slopes.
Cuthbert fine sandy loam, 25 to 35 percent slopes.
Cuthbert-Ruston complex, 12 to 35 percent slopes.
Gullied land, clayey materials.
Gullied land, loamy materials.
Gullied land, sandy materials.
Ruston fine sandy loam, 25 to 45 percent slopes.
Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded.
Saffell gravelly sandy loam, 12 to 20 percent slopes.
Shubuta fine sandy loam, 25 to 45 percent slopes.
Shubuta-gullied land complex.
Shubuta clay loam, 12 to 25 percent slopes, severely eroded.
Talbott cherty silt loam, 25 to 35 percent slopes.

Because of low moisture-supplying capacity and the low response to fertilizer, these soils are not very productive. In most places the soils are better suited to trees than to crops or pasture. On some of the less steep and less eroded areas fair to low yields of pasture can be made. Yields are probably not good enough, however, to justify the cost of establishing and maintaining the pastures.

CAPABILITY UNIT VIIs-1

This unit consists chiefly of steep soils that are rocky, gravelly, or cherty. The following soils are in this unit:

Bodine cherty silt loam, 12 to 35 percent slopes.
Bodine-Guin complex, 20 to 35 percent slopes.
Colbert-Talbott very rocky clays, 8 to 25 percent slopes.
Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes.
Gravelly alluvial land.
Rock land.
Waynesboro very gravelly sandy loam, 12 to 25 percent slopes.
Waynesboro very gravelly sandy loam, 25 to 45 percent slopes.

All of these soils are droughty. They are low in fertility and their response to fertilizer is low. If these soils are used for pasture, yields are generally low and the cost of establishing and maintaining the pastures is fairly high. The soils generally are best used for trees.

Estimated Yields

Estimated average acre yields of the principal crops grown in the county are given in table 2. Yields are given for each soil under two levels of management. In columns A are listed yields to be expected under management now common in the county. The yields in columns B are those to be expected under improved management practices as defined in this subsection.

The estimates in columns B are based on (1) yields obtained in long-term experiments on a few soils, and (2) estimates by agronomists and soil scientists who have had much experience with the crops and soils of Hardin County.

Data on yields obtained from experiments were adjusted to reflect the combined effects of slope, erosion, weather, and levels of management. If such data were not available, estimates were made by using available data for similar soils. All estimates are based on average rainfall in the area over a long period of time, without irrigation.

The estimates do not take into account the hazard of overflow for soils of the bottom lands. Some soils of the bottom lands are flooded when flow in the Tennessee River is too high and water backs up in the tributary streams. Normally, the elevation of the flow in the Tennessee River is 354 feet. When a crest of 380 feet is reached in the Tennessee River, the water cannot be held back, even by the reservoirs of the TVA. Consequently, most of the acreage in the Wolftever-Beason-Egam soil association is then covered by floodwaters. Floods do not come every year, nor do they completely cover soils along tributary streams each time they occur.

Nevertheless, flooding is a hazard to be considered in managing soils of the bottom lands, and for this reason dates of flooding and elevation of crest for the Tennessee River for a 10-year period are listed as follows:

	Feet
1949	
January 10	386. 7
January 25	378. 14
February 22	373. 01
March 31	371. 8
July 19	370. 04
1950	
February 16	384. 0
March 18	381. 5
1951	
February 7	380. 7
April 1	385. 4
1952	
December 28	379. 5
January 30	374. 0
March 14	376. 0
March 26	373. 22
1953	
February 14	375. 1
February 26	376. 6
March 5	371. 2
1954	
January 27	385. 6
1955	
February 25	370. 6
March 24	385. 6
1956	
February 7	383. 2
February 21	374. 0
March 18	370. 5
December 15	373. 3
1957	
February 6	392. 4
November 21	386. 4
December 11	373. 0
December 24	372. 7
1958	
May 2	375. 5
May 12	374. 3
1959	
December 20	372. 03

TABLE 2.—*Estimated average acre yields of principal crops under two levels of management*

["Drained" refers chiefly to removal of excess surface water by open ditches. Absence of yield indicates crop ordinarily is not grown on the soil specified and is not suited to the soil]

Soil	Corn		Cotton (lint)		Soybeans		Oats		Alfalfa		Lespedeza		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Almo silt loam:	*Bu.*	*Bu.*	*Lbs.*	*Lbs.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Drained	27	45			14	25					0.6	1.0	75	120
Undrained					12	18							60	95
Beason silt loam	33	48	400	525	19	27					.8	1.3	85	135
Bodine cherty silt loam, 12 to 35 percent slopes													30	50
Bodine cherty silt loam, 5 to 12 percent slopes							18	26			.3	.5	35	60
Bodine-Guin complex, 20 to 35 percent slopes														
Boswell fine sandy loam, 2 to 8 percent slopes	25	38	300	425	10	15	27	40	1.5	2.2	.4	.6	55	80
Boswell fine sandy loam, 8 to 12 percent slopes	20	32					25	36	1.6	2.0	.3	.5	50	75
Boswell silty clay, 2 to 8 percent slopes, severely eroded	18	24	200	275			20	28	1.2	1.8	.2	.4	35	50
Boswell silty clay, 8 to 12 percent slopes, severely eroded											.2	.4	25	40
Boswell soils, 12 to 25 percent slopes, eroded													40	60
Brandon silt loam, 5 to 8 percent slopes	33	45	375	500	12	16	27	44	1.5	2.2	.6	.9	85	115
Brandon silt loam, 8 to 12 percent slopes	25	40	325	425	10	14	25	38	1.6	2.0	.4	.7	70	100
Bruno loamy fine sand	17	25									.4	.6	45	60
Captina silt loam, 2 to 5 percent slopes, eroded	35	58	375	500	15	20	30	46			.7	1.2	95	135
Captina silt loam, 0 to 2 percent slopes	38	60	400	550	17	22	33	50			.8	1.4	105	150
Captina silty clay loam, 2 to 8 percent slopes, severely eroded	24	35	250	325	8	12	20	30			.5	.8	65	95
Colbert silty clay loam, 5 to 12 percent slopes							18	25			.4	.6	45	75
Colbert silty clay loam, 12 to 25 percent slopes													40	70
Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes													45	60
Colbert-Talbott very rocky clays, 8 to 25 percent slopes													35	50
Collins fine sandy loam	48	75	540	750	19	28	32	45	1.8	2.7	1.3	1.8	110	180
Collins loam, local alluvium	50	80	540	760	20	29	32	45	1.9	2.8	1.4	1.9	115	190
Collins silt loam	50	80	540	760	20	29	32	45	1.9	2.8	1.4	1.9	115	190
Culleoka silt loam, 5 to 12 percent slopes	32	50	400	550	12	16	30	45	1.6	2.3	.5	.7	70	100
Culleoka silt loam, 12 to 35 percent slopes													50	80
Cuthbert fine sandy loam, 12 to 25 percent slopes													42	60
Cuthbert fine sandy loam, 25 to 35 percent slopes														
Cuthbert-Ruston complex, 12 to 35 percent slopes													38	50
Cuthbert and Susquehanna soils, 5 to 12 percent slopes			275	350			22	30			.3	.5	50	70
Dandridge-Needmore complex, 12 to 35 percent slopes													50	65
Dandridge-Needmore complex, 8 to 12 percent slopes							25	35	1.5	2.0	.4	.6	65	90
Dexter loam, 2 to 5 percent slopes, eroded	40	65	500	650	19	28	38	55	2.2	3.0	.8	1.3	95	150
Dexter loam, 5 to 8 percent slopes, eroded	35	56	425	550	17	24	34	50	1.8	2.6	.7	1.0	85	130
Dexter loam, 8 to 12 percent slopes	28	45	350	475	12	19	28	42	1.7	2.3	.5	.9	80	120
Dexter clay loam, 2 to 5 percent slopes, severely eroded	32	45	400	525	16	22	32	48	1.7	2.4	.6	1.1	80	120
Dexter clay loam, 5 to 8 percent slopes, severely eroded	25	37	330	425	12	18	25	38	1.3	1.8	.4	.7	60	100
Dexter clay loam, 8 to 12 percent slopes, severely eroded	20	28	300	350			23	35	1.2	1.6	.4	.6	55	95
Dulac silt loam, 2 to 5 percent slopes	37	55	425	575	12	18	34	46	1.5	2.0	.7	1.2	90	135
Dulac silt loam, 2 to 5 percent slopes, eroded	36	52	410	550	12	17	32	44	1.3	1.8	.6	1.1	85	130
Dulac silt loam, 2 to 5 percent slopes, severely eroded	25	38	320	420	9	12	22	35	1.1	1.4	.5	.8	60	95
Dulac silt loam, 5 to 8 percent slopes	30	46	340	455	10	14	25	36	1.2	1.5	.6	1.0	80	115
Dulac silt loam, 5 to 8 percent slopes, severely eroded	18	30	275	345	8	10	20	24	.8	1.0	.4	.6	50	85
Dunning silty clay loam:														
Drained	35	50			18	26					1.1	1.8	95	145
Undrained											.7	1.2	60	110
Egam silty clay loam	40	65	400	500	17	24	38	50	1.5	2.0	.9	1.4	95	160
Ennis silt loam	60	95	525	750	21	30	38	55	2.0	2.7	1.1	1.8	130	195
Ennis silt loam, local alluvium	60	95	525	750	20	28	38	55	2.0	2.7	1.0	1.6	125	190

See footnote at end of table.

TABLE 2.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Soil	Corn		Cotton (lint)		Soybeans		Oats		Alfalfa		Lespedeza		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lbs.*	*Lbs.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Ennis cherty silt loam	45	65	425	575	17	23	30	45	1. 8	2. 4	. 7	1. 2	95	160
Ennis cherty silt loam, local alluvium	45	65	425	575	17	23	30	45	1. 8	2. 4	. 7	1. 2	95	160
Ennis fine sandy loam	55	85	500	700	19	26	35	50	2. 0	2. 6	. 8	1. 4	115	175
Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded	22	32	275	350	7	10	22	30	1. 7	2. 2	. 5	. 8	55	85
Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded	22	30	----	----	----	----	22	30	1. 5	2. 0	. 3	. 5	50	80
Falaya silt loam:														
Drained	40	65	525	700	20	27	----	----	----	----	1. 2	1. 7	105	180
Undrained	35	50	----	----	14	20	----	----	----	----	. 5	. 8	85	130
Falaya loam, local alluvium:														
Drained	40	65	525	700	20	27	----	----	----	----	1. 2	1. 7	105	180
Undrained	38	55	----	----	14	20	----	----	----	----	. 6	1. 0	105	180
Freeland loam, 2 to 5 percent slopes, eroded	40	57	435	575	16	23	34	50	1. 5	2. 1	. 7	1. 3	90	140
Freeland loam, 2 to 5 percent slopes, severely eroded	28	40	330	450	12	16	25	35	1. 1	1. 6	. 5	. 9	60	100
Freeland loam, 5 to 8 percent slopes, eroded	34	48	350	475	15	19	28	40	1. 2	1. 7	. 6	1. 1	75	125
Freeland loam, 5 to 8 percent slopes, severely eroded	22	33	325	375	13	15	22	30	. 8	1. 2	. 4	. 7	50	90
Gravelly alluvial land	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Gullied land, clayey materials	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Gullied land, loamy materials	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Gullied land, sandy materials	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Hatchie loam:														
Drained	30	48	420	525	18	24	25	36	----	----	. 7	1. 2	85	130
Undrained	26	38	350	425	12	15	----	----	----	----	. 4	. 8	65	90
Humphreys silt loam, 2 to 5 percent slopes, eroded	45	70	500	675	20	28	42	60	2. 4	3. 4	. 9	1. 5	90	155
Humphreys cherty silt loam, 2 to 5 percent slopes, eroded	35	50	350	475	12	17	30	45	1. 6	2. 6	. 6	1. 1	60	100
Huntington silt loam	65	100	550	775	23	30	37	52	2. 2	3. 0	1. 4	1. 9	130	200
Huntington fine sandy loam	55	85	550	775	22	28	34	47	2. 0	2. 8	1. 2	1. 7	120	175
Landisburg cherty silt loam, 5 to 12 percent slopes, eroded	33	45	330	450	11	16	30	40	1. 2	1. 8	. 7	1. 1	75	110
Landisburg cherty silt loam, 12 to 20 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	60	85
Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded	24	35	240	300	8	11	24	30	1. 0	1. 4	. 4	. 7	50	75
Lee silt loam:														
Drained	35	50	----	----	16	22	----	----	----	----	. 8	1. 8	90	140
Undrained	----	----	----	----	----	----	----	----	----	----	. 4	. 6	----	----
Lee cherty silt loam:														
Drained	28	40	----	----	14	20	----	----	----	----	. 7	1. 2	75	125
Undrained	----	----	----	----	----	----	----	----	----	----	. 3	. 5	----	----
Lindside silt loam	55	80	550	750	21	30	----	----	----	----	1. 3	1. 8	130	200
Lindside silty clay loam	45	65	550	725	20	28	----	----	----	----	1. 2	1. 7	130	190
Lobelville silt loam	55	75	535	750	20	28	----	----	----	----	1. 2	1. 7	115	190
Lobelville cherty silt loam	45	65	525	725	19	26	----	----	----	----	. 8	1. 4	100	170
Magnolia fine sandy loam, 5 to 8 percent slopes	28	45	330	480	9	12	26	35	1. 7	2. 3	. 4	. 7	55	90
Magnolia fine sandy loam, 8 to 12 percent slopes	26	40	300	430	----	----	24	30	1. 6	2. 2	. 3	. 6	50	85
Magnolia fine sandy loam, 12 to 25 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	40	70
Mantachie fine sandy loam:														
Drained	38	55	500	675	19	25	----	----	----	----	1. 1	1. 6	100	170
Undrained	35	50	----	----	13	18	----	----	----	----	. 5	. 9	80	120
Melvin and Newark silt loams:														
Drained	38	60	430	550	19	26	----	----	----	----	. 9	1. 5	105	145
Undrained	32	40	----	----	14	18	----	----	----	----	. 4	. 6	85	120
Minvale cherty silt loam, 5 to 12 percent slopes	36	48	350	480	12	17	33	45	1. 7	2. 3	. 7	1. 2	80	115
Minvale cherty silt loam, 12 to 25 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	65	95
Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded	25	35	250	325	8	11	25	33	1. 5	2. 0	. 5	. 8	50	75
Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----	----	----	35	60
Mountview silt loam, 5 to 8 percent slopes	32	45	390	520	11	16	33	45	1. 7	2. 3	. 7	1. 1	75	110
Paden silt loam, 2 to 5 percent slopes	36	55	430	575	13	19	37	50	1. 3	1. 9	. 7	1. 3	90	135
Paden silt loam, 2 to 5 percent slopes, eroded	34	52	415	550	13	18	35	48	1. 3	1. 9	. 7	1. 2	90	130

See footnote at end of table.

TABLE 2.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Soil	Corn		Cotton (lint)		Soybeans		Oats		Alfalfa		Lespedeza		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lbs.*	*Lbs.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Paden silt loam, 2 to 5 percent slopes, severely eroded	24	38	325	425	9	13	24	33	1.1	1.5	.4	.8	60	95
Paden silt loam, 5 to 8 percent slopes	32	48	355	460	10	15	33	42	1.2	1.7	.6	1.0	80	115
Paden silt loam, 5 to 8 percent slopes, eroded	30	44	345	440	10	14	30	40	1.2	1.6	.5	.9	75	110
Paden silt loam, 5 to 8 percent slopes, severely eroded	20	28	260	350	7	10	20	25	.8	1.1	.4	.7	55	85
Paden-gullied land complex	----	----	----	----	----	----	----	----	----	----	----	----	25	60
Pickwick silt loam, 2 to 5 percent slopes	45	70	465	660	20	28	38	55	2.4	3.6	.9	1.5	105	160
Pickwick silt loam, 2 to 5 percent slopes, eroded	43	65	440	635	20	27	37	52	2.4	3.5	.8	1.3	100	155
Pickwick silt loam, 5 to 8 percent slopes	40	60	420	550	17	24	38	48	2.1	3.3	.7	1.2	95	135
Pickwick silt loam, 5 to 8 percent slopes, eroded	35	55	400	520	15	22	33	43	2.0	3.2	.7	1.1	90	130
Pickwick silt loam, 8 to 12 percent slopes	32	47	370	480	14	20	30	40	2.0	3.1	.6	1.0	85	120
Pickwick silt loam, 12 to 25 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	60	105
Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded	33	46	375	500	14	20	33	42	1.9	3.0	.6	1.0	85	120
Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded	24	38	315	410	11	17	23	32	1.9	2.8	.5	.8	60	105
Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded	22	34	260	335	9	13	18	24	1.7	2.5	.4	.7	55	85
Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----	----	----	50	70
Pickwick-gullied land complex	----	----	----	----	----	----	----	----	----	----	----	----	35	65
Robertsville silt loam:														
Drained	30	44	360	500	14	24	----	----	----	----	.6	1.0	85	120
Undrained	----	----	----	----	9	16	----	----	----	----	----	----	60	90
Rock land	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Ruston fine sandy loam, 5 to 8 percent slopes	25	34	270	375	----	----	25	38	----	----	.5	.8	60	95
Ruston fine sandy loam, 8 to 12 percent slopes	20	29	225	300	----	----	23	32	----	----	.4	.7	50	85
Ruston fine sandy loam, 12 to 25 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	42	75
Ruston fine sandy loam, 25 to 45 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----	.3	.5	35	60
Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----	----	----	32	50
Saffell gravelly sandy loam, 5 to 12 percent slopes	----	----	----	----	----	----	18	26	----	----	.3	.5	35	60
Saffell gravelly sandy loam, 12 to 20 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Sequatchie fine sandy loam, 0 to 2 percent slopes	54	75	525	700	21	30	40	54	1.8	2.4	.9	1.4	105	155
Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded	50	70	500	675	20	26	37	50	1.7	2.2	.8	1.2	100	150
Sequatchie loam, 2 to 8 percent slopes, severely eroded	35	48	450	575	14	18	25	34	1.1	1.5	.6	.9	70	110
Shubuta fine sandy loam, 5 to 8 percent slopes	23	40	325	475	9	12	24	33	1.6	2.2	.4	.6	45	85
Shubuta fine sandy loam, 5 to 8 percent slopes, eroded	22	36	325	465	8	11	21	30	1.6	2.1	.4	.6	45	80
Shubuta fine sandy loam, 8 to 12 percent slopes	----	32	290	410	8	11	20	28	1.3	1.9	.3	.5	40	75
Shubuta fine sandy loam, 12 to 25 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	135	65
Shubuta fine sandy loam, 25 to 45 percent slopes	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Shubuta clay loam, 5 to 8 percent slopes, severely eroded	----	23	220	290	----	----	16	24	1.2	1.8	.2	.4	30	50
Shubuta clay loam, 8 to 12 percent slopes, severely eroded	----	----	----	----	----	----	16	21	1.1	1.6	.2	.4	25	45
Shubuta clay loam, 12 to 25 percent slopes, severely eroded	----	----	----	----	----	----	----	----	----	----	----	----	20	40
Shubuta-gullied land complex	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Silerton silt loam, 2 to 5 percent slopes	38	52	425	630	15	22	36	50	1.9	2.6	.6	1.0	80	145
Silerton silt loam, 2 to 5 percent slopes, eroded	37	50	410	615	14	20	32	48	1.8	2.5	.6	1.0	80	135
Silerton silt loam, 5 to 8 percent slopes	33	45	390	550	13	19	30	44	1.6	2.3	.6	1.0	65	120
Silerton silt loam, 5 to 8 percent slopes, eroded	32	42	370	525	13	18	28	40	1.5	2.2	.5	.9	60	115
Silerton silt loam, 8 to 12 percent slopes	28	40	335	480	12	17	27	38	1.5	2.1	.5	.9	60	105
Silerton silty clay loam, 2 to 5 percent slopes, severely eroded	27	40	335	480	12	16	27	38	1.5	2.1	.4	.8	60	105
Silerton silty clay loam, 5 to 8 percent slopes, severely eroded	22	31	285	390	11	14	21	30	1.1	1.6	.4	.7	50	95
Silerton silty clay loam, 8 to 12 percent slopes, severely eroded	20	26	250	330	----	----	17	24	.9	1.4	.4	.6	40	75
Sumter silty clay, 5 to 12 percent slopes, eroded	----	----	----	----	----	----	16	23	1.5	2.0	.4	.6	45	90

See footnote at end of table.

Table 2.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Soil	Corn		Cotton (lint)		Soybeans		Oats		Alfalfa		Lespedeza		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Lbs.*	*Lbs.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Sumter silty clay, 12 to 35 percent slopes, eroded	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	35	60
Swamp	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Taft silt loam	28	45	375	500	16	22	-----	-----	-----	-----	. 7	1. 2	80	130
Talbott silt loam, 2 to 5 percent slopes	32	40	370	460	12	17	32	48	1. 8	2. 7	. 6	1. 0	75	135
Talbott silt loam, 5 to 8 percent slopes	25	34	290	380	10	14	27	38	1. 6	2. 3	. 5	. 9	65	120
Talbott silt loam, 8 to 12 percent slopes	20	30	260	340	9	12	24	33	1. 5	2. 1	. 3	. 7	60	105
Talbott silt loam, 12 to 25 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	45	85
Talbott silty clay, 5 to 8 percent slopes, severely eroded	-----	21	200	250	7	9	20	26	. 9	1. 3	. 3	. 6	45	80
Talbott silty clay, 8 to 25 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	35	70
Talbott cherty silt loam, 5 to 12 percent slopes	22	30	250	310	8	11	22	32	1. 5	2. 0	. 4	. 7	55	100
Talbott cherty silt loam, 12 to 25 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	45	80
Talbott cherty silt loam, 25 to 35 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	15	22	1. 0	1. 4	-----	. 5	40	70
Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	25	45
Vicksburg loam, local alluvium	58	90	550	750	-----	30	40	55	1. 7	2. 3	1. 2	1. 7	130	190
Vicksburg loam	58	90	550	750	-----	30	40	55	1. 7	2. 3	1. 2	1. 8	130	195
Waverly silt loam:														
Drained	35	50	400	550	19	30	-----	-----	-----	-----	. 8	1. 4	95	140
Undrained	25	35	-----	-----	12	24	-----	-----	-----	-----	. 4	. 8	75	115
Waverly fine sandy loam:														
Drained	32	45	400	550	16	28	-----	-----	-----	-----	. 7	1. 2	95	135
Undrained	25	32	-----	-----	10	22	-----	-----	-----	-----	. 4	. 7	80	110
Waynesboro fine sandy laom, 2 to 5 percent slopes	40	60	435	640	18	26	36	50	2. 0	2. 8	-----	1. 4	85	140
Waynesboro fine sandy loam, 5 to 8 percent slopes	35	54	410	535	15	23	30	42	1. 7	2. 4	-----	1. 1	75	120
Waynesboro fine sandy loam, 8 to 12 percent slopes	30	45	350	460	13	19	26	37	1. 6	2. 2	-----	. 9	60	105
Waynesboro fine sandy loam, 12 to 35 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	50	90
Waynesboro clay loam, 2 to 5 percent slopes, severely eroded	31	46	380	500	13	19	28	40	1. 6	2. 2	-----	. 9	65	110
Waynesboro clay loam, 5 to 8 percent slopes, severely eroded	24	33	300	400	11	16	22	31	1. 4	1. 9	-----	. 7	50	90
Waynesboro clay loam, 8 to 12 percent slopes, severely eroded	24	30	240	325	9	12	15	23	1. 4	1. 7	-----	. 6	40	70
Waynesboro clay loam, 12 to 35 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	25	50
Waynesboro gravelly sandy loam, 5 to 8 percent slopes	23	38	310	430	14	20	27	38	1. 6	2. 2	. 4	. 8	60	100
Waynesboro gravelly sandy loam, 8 to 12 percent slopes	22	33	275	365	-----	-----	20	35	1. 0	1. 4	. 4	. 7	50	90
Waynesboro gravelly sandy loam, 12 to 25 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	40	75
Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	20	30	1. 0	1. 5	. 3	. 5	35	60
Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	25	45
Waynesboro very gravelly sandy loam, 12 to 25 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Waynesboro very gravelly sandy loam, 5 to 12 percent slopes	-----	-----	-----	-----	-----	-----	18	28	-----	-----	-----	-----	-----	-----
Waynesboro very gravelly sandy loam, 25 to 45 percent slopes	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Wolftever silt loam, 2 to 5 percent slopes	36	55	365	500	14	20	36	48	-----	-----	-----	1. 3	80	140
Wolftever silt loam, 0 to 2 percent slopes	38	58	385	525	15	22	38	50	-----	-----	-----	1. 4	95	145
Wolftever silt loam, 2 to 5 percent slopes, eroded	35	50	340	475	12	18	32	44	-----	-----	-----	1. 1	90	132
Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded	26	35	270	400	10	14	27	36	-----	-----	-----	. 9	60	95
Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded	20	25	260	325	9	12	18	26	-----	-----	-----	. 7	55	85

[1] Cow-acre-days is the number of days a year 1 acre will support a mature animal (cow, horse, or steer) without injury to the pasture.

The defined management practices, for all crops, for yields in columns B include the following:

1. Applying fertilizer at planting time according to the needs indicated by chemical tests and by past cropping and fertilizing practices.
2. Use of crop varieties that are high yielding and that are suited to the area.
3. Adequate preparation of the seedbed.
4. Planting or seeding by suitable methods, at suitable rates, and at the right times.
5. Inoculation of legumes.
6. Shallow cultivation of row crops.
7. Control of weeds, insects, and diseases.
8. Use of cropping systems that help conserve the soil, such as those suggested in the section "Capability Groups of Soils."
9. Water management where needed: sodding of waterways, contour cultivation, terracing, or contour stripcropping.
10. Protection of pastures from overgrazing.

The defined system of management for yields in columns B also includes specific practices for each of the principal crops of the county.

Corn.—For corn, management is defined for each of three different levels of estimated productivity.

1. Soils that yield 85 bushels or more per acre are excellent soils for corn. Practices upon which estimates are based are—
   a. Applying 100 to 125 pounds of nitrogen per acre.
   b. Planting 12,000 to 16,000 plants per acre.
2. Soils that yield 60 to 85 bushels per acre are good soils for corn. Practices upon which estimates are based are—
   a. Applying 75 to 90 pounds of nitrogen per acre.
   b. Planting 8,000 to 12,000 plants per year.
3. Soils that yield 40 to 60 bushels per acre are only fair soils for corn. Practices upon which estimates are based are—
   a. Applying 50 to 75 pounds of nitrogen per acre.
   b. Planting 8,000 plants per acre.

Soils that have an estimated potential yield of less than 40 bushels per acre under good management are poorly suited to corn and can be used more profitably for other crops.

Nitrogen may be supplied by using commercial fertilizer, barnyard manure, residues from legumes, or any combination of these.

For estimating the yield of corn silage, a convenient rule of thumb is that a stand of plants yielding 5 bushels of corn will yield about 1 ton of silage. For example, a soil that yields 100 bushels per acre would produce approximately 20 tons of silage per acre. The rates of fertilization and the number of plants per acre are the same for silage as for corn grown for grain.

Cotton.—For cotton, the estimated yields are based upon using a recommended variety of cotton and obtaining a good stand of plants. The fertilizing practices on which the estimated yields are based are—

1. Applying 400 to 500 pounds of 6–12–12 and a side dressing of 45 to 60 pounds of nitrogen on soils that yield 700 pounds of lint or more per acre.
2. Applying 300 to 400 pounds of 6–12–12 and a side dressing of 30 to 45 pounds of nitrogen on soils that yield 500 to 700 pounds of lint per acre.
3. Applying 200 to 300 pounds of 6–12–12 and a side dressing of 20 to 30 pounds of nitrogen on soils that yield 350 to 500 pounds per acre.

Soils that yield less than 400 pounds per acre under good management are poorly suited to cotton, and they probably can more economically be used for some other crop.

Upland areas in cotton require cover crops and green-manure crops. In most places spraying is needed five to seven times during the growing season to avoid damage by insects, especially the boll weevil. After the cotton crop is harvested, the stalks return to the soil. In this way, organic matter is added and the soil is given more protection from erosion.

Soybeans.—For soybeans, the estimated yields are based upon using a recommended variety of seed, using suitable cultural practices and cropping systems, and, if needed, water management. The fertilizer practices on which the estimated yields are based are—

1. Applying phosphate and potash at seeding time.
2. Adding lime according to the amount indicated by soil tests.

Small grain.—The fertilizer practices on which the estimated yields of oats are based are—

1. Applying 30 pounds of nitrogen at seeding time and 30 pounds in spring as a topdressing.

The estimated yields of oats can be converted to tons of hay by dividing the number of bushels of oats by 31. The result is the approximate yield of hay, in tons.

Alfalfa.—Management practices upon which the estimates for alfalfa are based are—

1. Applying as much as 15 pounds of nitrogen and 20 pounds of borax at seeding time.
2. Applying maintenance fertilizer annually, after the first year, either in amounts determined by soil tests or in the following proportions, per acre: 20 pounds of borax, at least 120 pounds of potash, and 30 pounds of phosphate.
3. Mowing and controlling grazing properly; no cutting of hay after about September 10.

Estimated yields of alfalfa on alluvial soils apply only if ponding or flooding is not a hazard.

Korean and Kobe lespedeza.—Management practices upon which the estimates for lespedeza are based are—

1. Seeding in spring on a prepared seedbed, or volunteer seeding and adding fertilizer according to needs indicated by soil tests.
2. Overseeding in barley or wheat. Oats tend to be more competitive than barley or wheat and are less desirable for an overseeding of lespedeza.

Annual yields of lespedeza grown by the second method have been estimated to be 50 percent of those for lespedeza seeded alone. Research and field observations indicate that the overseeding method results in nearly complete failure of the lespedeza crop 1 out of every 2 years.

If the small grain is harvested for hay, the probability of a failure of the lespedeza crop is less. Under this system the yield of lespedeza can generally be expected to be 80 percent as much as the yield of lespedeza seeded alone.

Pasture.—The practices on which yields of pasture mixtures are based are—

1. Applying fertilizer at seeding time according to needs indicated by soil tests.
2. Applying up to 30 pounds of nitrogen as a top-dressing annually, late in February, if there is an insufficient amount of clover in the mixture.
3. Applying phosphate and potash annually.

The more common pasture plants in Hardin County are tall fescue, bermudagrass, orchardgrass, and whiteclover. The Bodine, Colbert, Cuthbert, Dandridge-Needmore, Shubuta, Ruston, and Talbott soils are more droughty than the other soils. These soils are better suited to a mixture of tall fescue and whiteclover or to bermudagrass and whiteclover than to orchardgrass and whiteclover.

The Almo, Dunning, Lee, Robertsville, and Waverly soils and the Melvin and Newark silt loams are poorly drained. These soils are better suited to a mixture of tall fescue and whiteclover than to other mixtures of pasture plants.

Any of the common pasture plants can be grown on the rest of the soils of the county.

The number of tons of air-dry forage that can be expected on a particular soil can be computed by dividing the number of cow-acre-days given in table 1 by 53.

Woodland Uses of the Soils [2]

Vast, nearly impregnable forests originally covered Hardin County. These forests were made up of both hardwoods and pines in a greater variety than in any of the forests in other west Tennessee counties. On the bottom lands were oak, cypress, redgum, and other trees that tolerated wetness. White oak grew mainly along bottom lands of the Tennessee River and along bottom lands of other large streams. In the uplands there was a variety of hardwoods. In the eastern part of the county, pine forests covered much of the acreage. In the southern part of the county, forests of pines and hardwoods predominated, but in the northern part the trees were largely hardwoods.

These virgin forests were cut mainly to provide firewood for the early settlers, but some trees were cut for sawtimber. White oaks were cut for staves, cypress for shingles and to make curbings for wells, and hickories for ax handles. After 1870, markets for lumber were made accessible by river transportation and the number of sawmills increased. Cutting on a large scale, however, began about 1917. A survey made in 1959 by the Kentucky-Tennessee Section of the Society of American Foresters showed that there were 37 wood-processing plants in the county. These included stationary mills, mobile units, and a large paper and pulpwood plant at Counce.

About 58 percent of the total land area in the county was still in woodland in 1955 (*6*). The principal forest types that make up the present woodlands consist of upland hardwoods, bottom-land hardwoods, shortleaf pines, yellow pine-hardwoods, and redcedar-hardwoods (*5*). A recent field check indicates that there are 96 different kinds of trees now growing in the county. Among the species are 20 different kinds of oaks. Others are black walnut, yellow-poplar, ash, hickory, black cherry, beech, birch, cottonwood, cypress, elm, tupelo-gum and other kinds of gum, willow, and various other hardwoods and redcedar. There are also various kinds of pines. There is probably a relationship between the kinds of trees in the county and the kinds of soils.

The soils and forest sites of Hardin County vary widely in their suitability for trees. Differences among the forest sites are related to differences in the landscape, climate, and the kind of soil. Among the characteristics of a soil that affect its productive capacity for trees, and thus affect the site, are the structure, the supply of plant nutrients, and the ability to hold moisture. Differences in the soil also affect the ability of the trees to produce seed and the rate of survival of the seedlings; the depth to which roots can penetrate and how they develop; the limitations to use of farm equipment; the degree of competition from undesirable plants; and the hazards of windthrow and erosion.

Management of woodlands

The value of woodlands can be increased by preventing fires and by protecting the sites from trampling and grazing by livestock. It can also be increased by planting desirable trees, by systematically removing cull and weed trees, and by preventing overcutting. Overcutting and the removal of the better trees and leaving the poorer trees causes a lack of desirable seed trees. Grazing damages a wooded area as much as burning or overcutting. The grazing animals browse on young trees and damage or kill them. They trample the soil and cause severe erosion. Estimates indicate that about 11 percent of the wooded area in the county has been damaged by grazing (*6*). The damage ranges from light to severe.

Interest in good woodland management is increasing among farmers in the county. In 1951, a program was voted to provide protection from fire for all wooded areas. The program is administered by the State Division of Forestry. Since 1952, landowners have planted an increasing number of trees, particularly in idle areas that are steep and eroded. If these areas have not reseeded naturally to desirable trees, pines are generally planted. Loblolly pines are planted where the soil is fairly deep, the slope is favorable, and the supply of moisture is adequate. Shortleaf pine is planted on the drier sites. In addition, yellow-poplar and black walnut have been planted successfully on better sites.

Management of the stands on the various forest sites varies. Foresters are available to advise the farmer on how to manage the areas to obtain good stands and to help select trees to cut for market. General management of the principal forest types is discussed in the paragraphs that follow.

In areas of upland hardwoods where the woodlands consist of oaks, red oaks should be encouraged. They grow faster than the other oaks on soils that are clay, clay loam, or loam. White oaks also grow well on these soils and on a mixture of sand and clay. Growing room can be provided for the red oaks and white oaks by removing black oaks and other trees that are poorly formed. To help regenerate the stand, schedule cutting so that an acorn, or seed crop, is available for reseeding. It does not pay to grow hardwoods to saw-log size on the deep, sandy soils. Loblolly and shortleaf pines should be encouraged on these areas. Pruning, weeding, thinning, and intermediate and harvest cutting will help obtain maximum growth and quality of pure stands of the pines.

[2] This section is by C. E. Burger, woodland conservationist, SCS, Nashville, Tenn.

Stands of yellow pine and hardwoods need to be cut carefully. Overcutting and uncontrolled grazing cause the stands to be understocked. If the stands are opened too rapidly, grass and brush are likely to encroach and impede regeneration of the stand. Systematic cutting of the trees to leave a sufficient number of desirable trees well distributed over the area will control openings. It will also give the trees room to grow and to reproduce their kind. Other cutting operations needed are about the same as for other forest types.

The number of desirable trees in sites of bottom-land hardwoods has been reduced by overcutting. In places where the soil is well drained, the stands can be improved by leaving desirable trees for seed and removing undesirable trees that have restocked. Trees on the bottom lands are likely to be damaged by windthrow if the stands are opened too rapidly. Because of wetness, logging should be done when the soils and the roots of trees are least likely to be damaged.

Redcedar-hardwood sites can be managed to produce more profitable yields of the redcedars. Selective cutting of the redcedars will give more room for the remaining redcedars and will keep enough of them for natural stocking. In this way, the number of redcedars will increase. In places the less desirable trees can be removed by cutting or by the use of chemicals.

Woodland suitability groupings

To assist owners of woodland in planning the use of their soils, the soils of Hardin County have been placed in woodland suitability groups, which are listed in table 3. Each group is made up of soils that require the use of similar kinds of conservation practices and other management and that have comparable potential productivity. For each group, ratings are given according to the capabilities, the limitations, and the hazards on soils that are used for woodland. Site index ratings are given for each group, and suitable species of trees are listed. The site index is the average height of the dominant trees in a well-stocked stand at a specified age, usually 50 years.

The kinds of trees that grow best on the soils of each group are listed in table 3 by species. Growing these kinds of trees will help determine the management needed and increase development of the woodlands.

Competition from other plants refers to the degree of competition that can be expected from brush, grass, and undesirable trees that invade the site when openings are made in the forest canopy. A rating of *slight* means that competition from other plants is no special problem; undesirable trees may invade the site but will not delay natural regeneration of the stand or slow down its early growth. A rating of *moderate* means that plant competition develops but generally does not prevent an adequate stand of trees from being established. A rating of *severe* means that plant competition prevents trees from restocking naturally and that tree seedlings must be planted; also, when the seedlings are planted, the competing plants will need to be eliminated.

Limitations to the use of woodland equipment refers to the characteristics of the soils that restrict or prohibit the use of equipment that is commonly used in tending the trees and in harvesting them. By *slight* is meant that there is no restriction in the kind of equipment or in the time of year it is used. By *moderate* is meant that there is a seasonal restriction of less than 3 months in using the equipment. By *severe* is meant that there is a seasonal restriction of more than 3 months in the use of equipment and that the equipment can be expected to cause serious damage to the roots of trees and to the structure of the soil.

Seedling mortality is the expected degree of mortality, or loss, of natural seedlings as influenced by kinds of soils. The rating *slight* means that ordinarily losses would not exceed 25 percent of the planted stock. Normally, satisfactory restocking can be obtained by the first planting and natural regeneration is adequate. A rating of *moderate* means that losses of 25 to 50 percent of the seedlings can be expected. A rating of *severe* means that planting losses are more than 50 percent of the stock planted.

The hazard of windthrow refers to windfirmness, as reflected by the characteristics of the soils that control the development of the root system of trees. By *slight* is meant that windthrow is no special problem and that cutting and thinning can be done with little danger of future losses from windthrow. A rating of *moderate* means that trees will remain standing unless the soil is very wet or there are winds of high velocity. A rating of *severe* means that, because the soil is too shallow for adequate development of roots and stability, the trees cannot withstand windthrow.

The hazard of erosion refers to the potential hazard of erosion of the soil. The ratings are based on the increasing risk of erosion, taking into account that less moisture is available for trees as soil is lost through erosion.

Except for the site index ratings, the ratings in table 3 were based largely upon the experience of local soil scientists, woodland conservationists, foresters, and landowners. They represent the best information about the way soil influences the growth and management of trees. The ratings are tentative and are subject to revision as more information becomes available.

In table 4 stand and yield information is given for well-stocked stands of loblolly pine of the Coastal Plain and for shortleaf pine. Table 5 gives stand and yield information for second-growth upland oak and bottom-land hardwoods. The information provides a basis for relating research on timber volume production by site index classes and age of the species to the different kinds of soils shown on the soil map. Tables 4 and 5 show how site index ratings can be converted readily into cords or into cubic or board feet measure. This information, used along with information in table 3, will help owners of woodlands estimate the financial return to be expected from a woodland crop.

WOODLAND GROUP 1

This group consists of deep soils that are well drained. The soils are undulating to hilly and are on uplands and terraces. About 13 percent of the acreage in woodland in this county is made up of soils in this group. The following soils are in the group:

Dexter clay loam, 2 to 5 percent slopes, severely eroded.
Dexter clay loam, 5 to 8 percent slopes, severely eroded.
Dexter clay loam, 8 to 12 percent slopes, severely eroded.
Dexter loam, 2 to 5 percent slopes, eroded.

Dexter loam, 5 to 8 percent slopes, eroded.
Dexter loam, 8 to 12 percent slopes.
Pickwick silt loam, 2 to 5 percent slopes.
Pickwick silt loam, 2 to 5 percent slopes, eroded.
Pickwick silt loam, 5 to 8 percent slopes.
Pickwick silt loam, 5 to 8 percent slopes, eroded.
Pickwick silt loam, 8 to 12 percent slopes.
Pickwick silt loam, 12 to 25 percent slopes.
Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded.
Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded.
Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded.
Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded.
Pickwick-gullied land complex.
Silerton silt loam, 2 to 5 percent slopes.
Silerton silt loam, 2 to 5 percent slopes, eroded.
Silerton silt loam, 5 to 8 percent slopes.
Silerton silt loam, 5 to 8 percent slopes, eroded.
Silerton silt loam, 8 to 12 percent slopes.
Silerton silty clay loam, 2 to 5 percent slopes, severely eroded.
Silerton silty clay loam, 5 to 8 percent slopes, severely eroded.
Silerton silty clay loam, 8 to 12 percent slopes, severely eroded.
Waynesboro clay loam, 2 to 5 percent slopes, severely eroded.
Waynesboro clay loam, 5 to 8 percent slopes, severely eroded.
Waynesboro clay loam, 8 to 12 percent slopes, severely eroded.
Waynesboro clay loam, 12 to 35 percent slopes, severely eroded.
Waynesboro fine sandy loam, 2 to 5 percent slopes.
Waynesboro fine sandy loam, 5 to 8 percent slopes.
Waynesboro fine sandy loam, 8 to 12 percent slopes.
Waynesboro fine sandy loam, 12 to 35 percent slopes.

In all of these soils, the root zone is 4 or 5 feet deep. These soils range from moderately low to moderately high in fertility and in moisture-supplying capacity. They are medium acid to strongly acid. The texture of the surface layer is mainly loam and silt loam. But, in areas that are severely eroded the texture of the surface layer is similar to that of the subsoil, which is silty clay loam and clay loam.

These soils are well suited to hardwoods and conifers of high quality. Desirable species are listed in order of priority for hardwoods and conifers in table 3. A 15-year-old plantation of loblolly pine is shown in figure 11.

Figure 11.—**This 15-year-old plantation of loblolly pine is on Silerton silt loam, 5 to 8 percent slopes, eroded.**

Competition from other plants on these soils delays, but does not prevent, satisfactory stocking of desirable trees after cutting. Generally, the limitation to use of farm equipment is slight. On moderately steep soils logging should be on the contour. Special care is also required if logging is to be done in steep or remote areas.

Red oak and white oak can be encouraged by removing poorly formed trees to provide room for these desirable oaks to grow. Harvesting merchantable trees, following a good crop of acorns, will help the trees to reproduce naturally. Mortality of planted seedlings is generally between 25 and 50 percent, and replanting may be needed. On areas that are to be converted to pines, it is best to remove the overstory by cutting or by chemicals.

WOODLAND GROUP 2

The soils in this group are shallow to deep, and some are eroded and severely eroded. About 11 percent of the acreage in woodland in this county consists of soils in this group. The following soils are in the group:

Brandon silt loam, 5 to 8 percent slopes.
Brandon silt loam, 8 to 12 percent slopes.
Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded.
Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded.
Minvale cherty silt loam, 5 to 12 percent slopes.
Minvale cherty silt loam, 12 to 25 percent slopes.
Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded.
Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded.
Mountview silt loam, 5 to 8 percent slopes.
Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded.
Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded.
Waynesboro gravelly sandy loam, 5 to 8 percent slopes.
Waynesboro gravelly sandy loam, 8 to 12 percent slopes.
Waynesboro gravelly sandy loam, 12 to 25 percent slopes.

The Brandon soils, which are moderately shallow, are on uplands where they are underlain by gravel. They are generally silt loams, but where the slopes are steepest they consist of fine sandy loam with gravel. The Etowah soils are on terrace benches, and the Minvale are in cherty colluvial areas at the base of slopes and along drainageways. The Etowah and Minvale soils are deep. The Mountview soil is shallow and is on ridgetops underlain by cherty limestone material. The Waynesboro soils are moderately deep and are on high terraces.

Except for the Brandon and Mountview soils, which are low in fertility, all of the soils are moderately high in natural fertility. They range from moderate to low in moisture-supplying capacity. They are medium acid to strongly acid. Permeability of the surface layer is moderately rapid to very rapid, but that of the subsoil is moderate. Runoff is medium to slow, except in the severely eroded areas, where runoff is rapid.

The soils in this group are suited to mixed hardwoods and conifers. Desirable species are listed in table 3.

On the Brandon and Mountview soils, loblolly pine grows well but other desirable trees grow more slowly. The Etowah soils are suitable for growing redcedar. Because the natural fertility and supply of moisture are favorable in the Minvale soils, oak and yellow-poplar make excellent growth on them. The Waynesboro soils should be planted to loblolly or shortleaf pines, which will make satisfactory growth because these soils are fairly high in fertility and in moisture-supplying capacity.

TABLE 3.—*Estimated ratings of woodland suitability grouping of soils*

Woodland group and mapping symbols	Estimated site index range	Suitable species	Competition from other plants	Limitations to use of woodland equipment	Seedling mortality	Hazard of— Windthrow	Hazard of— Erosion
Group 1: DcB3, DcC3, DcD3, DeB2, DeC2, DeD, PkB, PkB2, PkC, PkC2, PkD, PkE, PwB3, PwC3, PwD3, PwE3, Px, SrB, SrB2, SrC, SrC2, SrD, SsB3, SsC3, SsD3, WcB3, WcC3, WcD3, WcF3, WfB, WfC, WfD, WfF.	Upland oak 75–85, yellow-poplar 80–100, black walnut 60–80, shortleaf pine 65–75, loblolly pine 75–85.	White oak, southern red oak, northern red oak, yellow-poplar, black walnut, black cherry, white ash, loblolly pine, shortleaf pine, and redcedar.	Moderate	Slight	Slight to moderate.	Slight	Slight.
Group 2: BrC, BrD, EtC3, EtD3, MhD, MhE, MnD3, MnE3, MoC, WgD3, WgE3, WmC, WmD, WmE.	Upland oak 65–85, black cherry 50–70, yellow-poplar 75–95, black walnut 65–75, loblolly pine 60–80, shortleaf pine 55–75, cedar 45–55.	Southern red oak, northern red oak, white oak, black cherry, yellow-poplar, loblolly pine, shortleaf pine, redcedar.	Moderate to severe.	Slight to moderate.	Moderate	Moderate to severe.	Slight.
roup 3: CaA, CaB2, CbB3, DkB, DkB2, DkB3, DkC, DkC3, FrB2, FrB3, FrC2, FrC3, LaD2, LaE, LcD3, PaB, PaB2, PaB3, PaC, PaC2, PaC3, Pc, WoA, WoB, WoB2, WvB3, WvC3.	Upland oak 65–85, yellow-poplar 80–100, loblolly pine 70–80, shortleaf pine 65–75, Virginia pine 60–70.	Northern red oak, white oak, white ash, yellow-poplar, catalpa, sweetgum, loblolly pine, shortleaf pine, Virginia pine.	Moderate	Moderate	Moderate	Moderate	Slight.
Group 4: Bu, Cf, Cg, Ch, Ea, Ec, Ee, Ef, Em, En, HcB2, HmB2, Hn, Hu, Ln, Ls, Lt, Lv, ScA, ScB2, SeC3, Vb, Vc.	Yellow-poplar 70–95, black walnut 65–75, bottom-land oak 70–90, loblolly pine 70–80.	White ash, yellow-poplar, black walnut, black cherry, sweetgum, cottonwood, sycamore, beech, southern white oak, red maple, loblolly pine.	Severe	Slight to moderate.	Slight to moderate.	Slight	Slight.
Group 5: BfC, BfD, BoC3, BoD3, BpE2, CnE, CnF, CrF, CsD, MaC, MaD, MaE, RfC, RfD, RfE, RfF, RuD3, RuE3, ShC3, ShD3, ShE3, SmC, SmC2, SmD, SmE, SmF, Sp.	Shortleaf pine 65–75, loblolly pine 70–80, Virginia pine 65–75, white oak 65–75.	Shortleaf pine, loblolly pine, Virginia pine.	Moderate	Slight	Slight to moderate.	Slight to moderate.	Slight to moderate.

Group 6: CcD, CcE, CkD, CkF, DaD, DaF, SuD2, SuF2, TbD, TbE, TbF, TcD3, TcE3, TsB, TsC, TsD, TsE, TtC3, TtE3.	Yellow-poplar 75–85, black walnut 65–80, redcedar 40–50, shortleaf pine 55–65, black locust 45–55.	Yellow-poplar, black walnut, red oak, black locust, redcedar, shortleaf pine.	Moderate	Moderate	Slight	Moderate	Slight.
Group 7: Am, Ba, Ha, Rb, Ta.	Eastern cottonwood 75–95, bottom-land oak 60–70.	Bottom-land oak, white ash, sweetgum, cypress, tupelo-gum, eastern cottonwood, loblolly pine.	Slight to moderate.	Severe	Slight to moderate.	Slight	Slight.
Group 8: Du, Fa, Fm, Le, Lm, Me, Mc, Sw, Wa, Wb.	Sweetgum 80–100, yellow-poplar 80–95.	White ash, swamp white oak, sweetgum, cypress, sycamore, tupelo-gum.	Moderate	Severe	Slight	Slight	Slight.
Group 9: BdD, BdF, BeF, CdE, CeE, Ga, Gc, Gm, Gs, Rc, SaD, SaE, WnD, WnE, WnF.	Upland oak 60–80, yellow-poplar 80–100, loblolly pine 60–85, shortleaf pine 50–60, redcedar 45–55, black walnut 50–60.	White oak, red oak, yellow-poplar, loblolly pine, shortleaf pine, redcedar.	Slight to severe.	Moderate to severe.	Moderate to severe.	Moderate to severe.	Slight to severe.

TABLE 4.—*Stand and yield information per acre for well-stocked, natural, even-aged stands of Coastal Plain loblolly pine and of shortleaf pine* [1]

COASTAL PLAIN LOBLOLLY PINE

Site index [2]	Age	Total height of average dominant trees	Trees [3]	Average diameter at breast height	Total merchantable volume: More than 4.5 inches diameter at breast height	Total merchantable volume: More than 9 inches diameter at breast height	Total merchantable volume: Average annual growth
	Year	*Feet*	*Number*	*Inches*	*Cords*	*M bd. ft.*[4]	*Bd. ft.*[4]
60	20	38	640	5.3	13.0	—	—
	30	49	415	7.1	21.5	1.8	60
	40	56	337	8.2	27.1	4.5	112
	50	60	292	9.0	31.1	6.7	134
	60	63	267	9.5	33.8	8.6	143
	70	65	250	9.9	35.9	9.8	140
	80	67	239	10.2	37.5	10.5	131
70	20	45	502	6.1	17.3	.6	30
	30	57	331	8.2	28.2	5.3	177
	40	65	266	9.5	35.5	9.2	230
	50	70	233	10.3	40.2	12.6	252
	60	74	213	11.0	43.7	15.3	255
	70	76	199	11.4	46.2	17.3	247
	80	78	189	11.7	48.1	18.7	234
80	20	51	418	6.9	21.9	1.8	90
	30	66	275	9.3	35.8	8.9	296
	40	74	221	10.7	44.8	14.9	372
	50	80	193	11.7	50.8	18.7	374
	60	84	176	12.4	54.9	23.3	388
	70	87	164	12.9	58.0	25.9	370
	80	90	156	13.2	59.7	27.5	344

SHORTLEAF PINE

Site index [2]	Age	Total height of average dominant trees	Trees [3]	Average diameter at breast height	Total merchantable volume: More than 4.5 inches diameter at breast height	Total merchantable volume: More than 9 inches diameter at breast height	Total merchantable volume: Average annual growth
50	20	31	1,170	4.0	8.8	.1	5
	30	39	808	5.1	17.4	.9	30
	40	45	623	6.0	23.9	2.4	60
	50	50	518	6.8	29.4	4.3	86
	60	54	448	7.5	33.9	6.4	107
	70	58	398	8.1	37.9	8.5	121
	80	61	362	8.6	41.5	10.6	132
60	20	38	848	5.0	15.9	.7	35
	30	47	585	6.3	25.8	3.0	100
	40	54	452	7.4	33.6	6.2	155
	50	60	376	8.4	40.0	9.7	195
	60	65	326	9.2	45.9	13.2	220
	70	70	283	10.0	50.8	16.8	240
	80	74	259	10.6	55.2	20.0	250
70	20	44	648	5.9	22.9	2.0	100
	30	54	446	7.5	34.2	6.5	216
	40	63	346	8.8	43.3	11.6	290
	50	70	288	9.9	51.2	16.8	336
	60	76	248	10.9	57.7	21.8	363
	70	81	221	11.8	63.7	26.4	377
	80	86	201	12.5	69.3	30.6	382
80	20	50	512	6.9	29.6	4.4	220
	30	62	353	8.7	42.5	11.1	370
	40	72	274	10.2	53.0	18.3	457
	50	80	227	11.5	62.2	25.2	504
	60	87	198	12.6	70.6	31.5	525
	70	93	175	13.7	77.5	37.5	536
	80	98	159	14.5	84.1	43.0	537

[1] Compiled from "Growth and Yields of Natural Stands of the Southern Pines" (*4*).

[2] The site index is the average height of the dominant trees in a well-stocked stand at 50 years of age.

[3] More than 0.5 inch diameter at breast height.

[4] Scribner log rule, measuring trees to a 6-inch top diameter inside bark.

TABLE 5.—*Stand and yield information per acre for well-stocked stands of second-growth upland oak and bottom-land hardwoods*

UPLAND OAK [1]

Site index	Age	Total height of average dominant trees	Trees	Average diameter at breast height	Total merchantable volume	Mean annual growth
	Years	*Feet*	*Number*	*Inches*	*Bd. ft. (Scribner)*	*Bd. ft. (Scribner)*
60	40	51	611	5. 3	500	12
	50	60	482	6. 3	1, 400	28
	60	67	390	7. 2	3, 150	52
	70	71	326	8. 0	5, 650	81
	80	75	292	8. 8	8, 350	104
	90	77	268	9. 4	11, 050	123
	100	79	248	10. 1	13, 700	137
70	40	60	472	6. 0	1, 100	28
	50	70	374	7. 2	3, 250	65
	60	78	304	8. 3	6, 700	112
	70	83	252	9. 3	10, 550	151
	80	87	224	10. 2	14, 100	176
	90	90	207	11. 0	17, 200	191
	100	92	192	11. 7	19, 900	199
80	40	69	366	6. 9	2, 500	62
	50	80	290	8. 3	6, 650	133
	60	89	235	9. 5	11, 350	189
	70	95	196	10. 7	15, 900	227
	80	99	174	11. 7	19, 700	246
	90	104	161	12. 7	23, 050	256
	100	105	148	13. 6	26, 100	261

BOTTOM-LAND HARDWOODS [2]

Site index	Age	Total height of average dominant trees	Trees	Average diameter at breast height	Total merchantable volume	Mean annual growth
80	40	69	7	14. 6	400	10
	50	80	30	14. 8	2, 000	40
	60	88	49	15. 1	4, 070	68
	70	94	62	15. 4	6, 280	90
	80	99	71	15. 9	8, 430	105
	90	104	77	16. 5	10, 540	117
100	40	89	44	14. 8	4, 260	106
	50	100	64	15. 4	8, 180	164
	60	108	76	16. 1	12, 400	207
	70	115	86	17. 0	16, 510	236
	80	122	93	17. 8	20, 460	256
	90	127	97	18. 6	24, 120	268
	100	131	99	19. 3	27, 360	274
120	30	93	42	14. 7	3, 430	114
	40	108	75	15. 4	9, 850	246
	50	120	89	16. 3	16, 710	334
	60	129	97	17. 4	23, 620	394
	70	137	103	18. 5	30, 120	430
	80	144	107	19. 6	35, 940	449

[1] Compiled from U.S. Dept. Agr. Tech. Bul. No. 560 (*3*).
[2] Compiled from "Growth and Yield of Second-Growth Red Gum in Fully Stocked Stands on Alluvial Lands in the South" (*12*).

In places blackjack oak, blackgum, hawthorn, and saw brier give severe competition to growth of more desirable trees. Desirable trees, such as red oak and white oak, can be encouraged by removing poorly formed trees to provide space for growth. Harvesting merchantable trees, following a good crop of acorns, will provide openings and help the trees to reproduce naturally.

Generally, loss of between 25 and 50 percent of planted seedlings can be expected. Replanting may be needed. In areas that are to be converted to pines, it is best to remove the overstory by cutting or by chemicals.

WOODLAND GROUP 3

This group consists of moderately well drained soils that have a fragipan at a depth of about 24 inches. These soils are mainly undulating to sloping and are on uplands and low terraces. About 5 percent of the acreage in woodland in this county is made up of soils in this group. The following soils are in the group:

Captina silt loam, 0 to 2 percent slopes.
Captina silt loam, 2 to 5 percent slopes, eroded.
Captina silty clay loam, 2 to 8 percent slopes, severely eroded.
Dulac silt loam, 2 to 5 percent slopes.
Dulac silt loam, 2 to 5 percent slopes, eroded.
Dulac silt loam, 2 to 5 percent slopes, severely eroded.
Dulac silt loam, 5 to 8 percent slopes.
Dulac silt loam, 5 to 8 percent slopes, severely eroded.
Freeland loam, 2 to 5 percent slopes, eroded.
Freeland loam, 2 to 5 percent slopes, severely eroded.
Freeland loam, 5 to 8 percent slopes, eroded.
Freeland loam, 5 to 8 percent slopes, severely eroded.
Landisburg cherty silt loam, 5 to 12 percent slopes, eroded.
Landisburg cherty silt loam, 12 to 20 percent slopes.
Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded.
Paden silt loam, 2 to 5 percent slopes.
Paden silt loam, 2 to 5 percent slopes, eroded.
Paden silt loam, 2 to 5 percent slopes, severely eroded.
Paden silt loam, 5 to 8 percent slopes.
Paden silt loam, 5 to 8 percent slopes, eroded.
Paden silt loam, 5 to 8 percent slopes, severely eroded.
Paden-gullied land complex.
Wolftever silt loam, 0 to 2 percent slopes.
Wolftever silt loam, 2 to 5 percent slopes.
Wolftever silt loam, 2 to 5 percent slopes, eroded.
Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded.
Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded.

The fragipan in these soils restricts development of plant roots and movement of air and water. Consequently, these soils become saturated quickly. They are low to moderately low in natural fertility. They are strongly acid.

The soils in this group are well suited to mixed hardwoods and pines. Desirable trees are listed in table 3.

The Dulac, Freeland, and Paden soils occupy higher sites than the other soils in this group and are suitable for northern red oak, white oak, hickory, and other hardwoods of high quality. Loblolly and shortleaf pines are suitable for open areas on these soils and for areas that are to be converted to pines. The more nearly level areas are suitable for sweetgum, which can be planted in open areas of forests made up of oak and maple. On the Captina and Wolftever soils, the present forests are made up of white oak, swamp white oak, cherrybark oak, and hickory. Catalpa and cottonwood are suitable trees to plant in open areas on these soils. The Landisburg soils are suited to native upland hardwoods of high quality. Yellow-poplar grows well on the Landisburg soils because of moderate seepage.

Competition from other plants delays, but does not prevent, establishment of trees on the soils in this group. The use of farm equipment is somewhat limited because of the high water table.

WOODLAND GROUP 4

The soils in this group are deep and are well drained to moderately well drained. They are on low terraces, or

first bottoms, along the Tennessee River and its tributaries. Generally, they consist of stratified sand and silt, but in a few places they are cherty. About 3 percent of the acreage in woodland in this county is made up of soils in this group. The following soils are in the group:

Bruno loamy fine sand.
Collins fine sandy loam.
Collins loam, local alluvium.
Collins silt loam.
Egam silty clay loam.
Ennis cherty silt loam.
Ennis cherty silt loam, local alluvium.
Ennis fine sandy loam.
Ennis silt loam.
Ennis silt loam, local alluvium.
Humphreys cherty silt loam, 2 to 5 percent slopes, eroded.
Humphreys silt loam, 2 to 5 percent slopes, eroded.
Huntington fine sandy loam.
Huntington silt loam.
Lindside silt loam.
Lindside silty clay loam.
Lobelville cherty silt loam.
Lobelville silt loam.
Sequatchie fine sandy loam, 0 to 2 percent slopes.
Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded.
Sequatchie loam, 2 to 8 percent slopes, severely eroded.
Vicksburg loam.
Vicksburg loam, local alluvium.

The soils of this group are deep, friable, and permeable. They permit maximum growth of roots and provide an abundant supply of moisture and adequate nutrients for plants. These soils are slightly acid to strongly acid. They are subject to flooding, and the floodwaters remain from a few hours to 2 weeks.

Of the soils in this group, the Bruno soil occupies small, scattered areas and its use for trees is not important. Otherwise, the soils in this group are among the best in the county for trees. Desirable trees are listed in table 3.

Most areas of the soils in this group are used for crops. Only small, irregular, and inaccessible areas are planted to trees.

Competition from other plants delays, but does not prevent, establishment of trees. The competition from grass and weeds is severe. If cottonwood is planted, care is required in preparing the sites and in managing them to control the grass and weeds.

Limitation to use of equipment is largely in wet seasons when wetness of the sites makes them inaccessible to farm machinery.

WOODLAND GROUP 5

This group consists of deep, well-drained soils of uplands that are low to moderately low in moisture-supplying capacity. About 21 percent of the acreage in woodland in this county consists of soils in this group. The following soils are in the group:

Boswell fine sandy loam, 2 to 8 percent slopes.
Boswell fine sandy loam, 8 to 12 percent slopes.
Boswell silty clay, 2 to 8 percent slopes, severely eroded.
Boswell silty clay, 8 to 12 percent slopes, severely eroded.
Boswell soils, 12 to 25 percent slopes, eroded.
Cuthbert fine sandy loam, 12 to 25 percent slopes.
Cuthbert fine sandy loam, 25 to 35 percent slopes.
Cuthbert-Ruston complex, 12 to 35 percent slopes.
Cuthbert and Susquehanna soils, 5 to 12 percent slopes.
Magnolia fine sandy loam, 5 to 8 percent slopes.
Magnolia fine sandy loam, 8 to 12 percent slopes.
Magnolia fine sandy loam, 12 to 25 percent slopes.
Ruston fine sandy loam, 5 to 8 percent slopes.
Ruston fine sandy loam, 8 to 12 percent slopes.
Ruston fine sandy loam, 12 to 25 percent slopes.
Ruston fine sandy loam, 25 to 45 percent slopes.
Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded.
Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded.
Shubuta clay loam, 5 to 8 percent slopes, severely eroded.
Shubuta clay loam, 8 to 12 percent slopes, severely eroded.
Shubuta clay loam, 12 to 25 percent slopes, severely eroded.
Shubuta fine sandy loam, 5 to 8 percent slopes.
Shubuta fine sandy loam, 5 to 8 percent slopes, eroded.
Shubuta fine sandy loam, 8 to 12 percent slopes.
Shubuta fine sandy loam, 12 to 25 percent slopes.
Shubuta fine sandy loam, 25 to 45 percent slopes.
Shubuta-gullied land complex.

The soils in this group are friable and permit plant roots to develop adequately, but they are low in fertility and in organic matter. Also, they are strongly acid. Permeability is rapid in the surface layer, but it is slightly less rapid in the subsoil.

These soils are suited to pines, and desirable kinds are listed in table 3.

The present stands consist mainly of native shortleaf pine and of post oak, blackjack oak, black oak, chestnut oak, and hickory. Overcutting and burning have resulted in understocking and in trees of low quality. The more desirable shortleaf pines can be encouraged by eliminating the hardwoods through cutting or by chemicals. Removing the less desirable hardwoods will make room for the pines to grow and to restock naturally. Thus, the quality of the stand will be improved for production of pulpwood and saw logs.

Competition from other plants delays, but does not prevent, the establishment of trees. Because of the low supply of moisture, the low fertility of the soils, and the encroachment of brush, the survival of planted seedlings is likely to be low. Replanting may be needed.

WOODLAND GROUP 6

This group consists of moderately deep soils that are well drained. The soils are on ridges in the eastern part of the county. Slopes range from 5 to 35 percent. About 9 percent of the acreage in woodland in this county is made up of soils in this group. The following soils are in the group:

Colbert silty clay loam, 5 to 12 percent slopes.
Colbert silty clay loam, 12 to 25 percent slopes.
Culleoka silt loam, 5 to 12 percent slopes.
Culleoka silt loam, 12 to 35 percent slopes.
Dandridge-Needmore complex, 8 to 12 percent slopes.
Dandridge-Needmore complex, 12 to 35 percent slopes.
Sumter silty clay, 5 to 12 percent slopes, eroded.
Sumter silty clay, 12 to 35 percent slopes, eroded.
Talbott cherty silt loam, 5 to 12 percent slopes.
Talbott cherty silt loam, 12 to 25 percent slopes.
Talbott cherty silt loam, 25 to 35 percent slopes.
Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded.
Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded.
Talbott silt loam, 2 to 5 percent slopes.
Talbott silt loam, 5 to 8 percent slopes.
Talbott silt loam, 8 to 12 percent slopes.
Talbott silt loam, 12 to 25 percent slopes.
Talbott silty clay, 5 to 8 percent slopes, severely eroded.
Talbott silty clay, 8 to 25 percent slopes, severely eroded.

The Talbott and Colbert soils are underlain by limestone, the Dandridge-Needmore by calcareous shale, the Culleoka by sandstone, and the Sumter soils by clay that contains marine fossils and shells. These soils are moderate to low in fertility and are low in moisture-supplying capacity. They are mildly alkaline to strongly acid. Internal drainage is medium to slow.

The soils in this group are suited to hardwoods and conifers. Desirable species are listed in table 3.

The soils on the higher parts of side slopes and points of ridges are suited mainly to red oak, hickory, and pine. In the valleys the soils have a better supply of moisture than the soils on the ridgetops and are suited to beech, yellow-poplar, black walnut, and other trees of high quality. The Talbott and Colbert soils have milder slopes than the other soils in the group and are better suited to cedar. The Sumter soils are suited to redcedar, black locust, and mixed hardwoods.

Competition from other plants is mainly the encroachment of brush and second-growth hardwoods. If trees of low quality are removed and other good woodland management is used, the desirable trees will have room to grow and to restock naturally.

The use of farm equipment is limited mainly by steep slopes that restrict the use of heavy farm machinery.

WOODLAND GROUP 7

This group consists of poorly drained and somewhat poorly drained soils that have a fragipan at a depth of about 2 feet. About 5 percent of the acreage in woodland in this county consists of soils in this group. The following soils are in the group:

- Almo silt loam.
- Beason silt loam.
- Hatchie loam.
- Robertsville silt loam.
- Taft silt loam.

These soils become saturated and drain slowly. They are low in fertility and are strongly acid.

The soils in this group are suited mainly to hardwoods, but some pine is grown on higher lying areas of the Hatchie and Taft soils. Desirable species are listed in table 3.

Competition from other plants delays, but does not prevent, establishment of trees on these soils. Use of farm equipment is limited by frequent flooding. The soils become waterlogged, and common farm machinery cannot be used on them. If logging is done late in spring or early in summer, serious damage to the roots of trees and to the structure of the soils can be avoided.

Loss of seedlings ranges from slight to moderate because of competition from other kinds of vegetation.

WOODLAND GROUP 8

This group consists mainly of poorly drained and somewhat poorly drained soils that have a high water table much of the year. About 10 percent of the acreage in woodland in this county is made up of soils in this group. The following soils are in the group:

- Dunning silty clay loam.
- Falaya loam, local alluvium.
- Falaya silt loam.
- Lee cherty silt loam.
- Lee silt loam.
- Mantachie fine sandy loam.
- Melvin and Newark silt loams.
- Swamp.
- Waverly fine sandy loam.
- Waverly silt loam.

These soils are medium in texture and are friable. They are mostly strongly acid. Runoff and internal drainage are slow. In areas of Swamp, silt is continuously being laid down and the native vegetation is dying and being replaced by different species.

The soils in this group are suited to bottom-land hardwoods of high quality. Desirable species are listed in table 3.

Redgum, cherrybark oak, red maple, water oak, willow oak, white ash, hickory, tupelo-gum, cypress, white oak, birch, sycamore, and willow are the dominant trees on the soils in this group. Overcutting has caused large openings in the stands, and competing grasses and shrubs cover the open areas.

Desirable trees can be encouraged by controlling cutting. This will make room for the desirable trees without leaving large openings where competing plants can encroach. Also, if the cutting is done after the desirable trees have had a good crop of seed, natural regeneration of the trees will be improved.

The use of farm equipment is limited on these soils because they are wet much of the year. It is best to do logging late in spring or early in summer to avoid damaging the roots of trees and compacting the soil.

WOODLAND GROUP 9

This group consists mostly of shallow soils that are cherty or gravelly. About 23 percent of the acreage in woodland in this county consists of soils in this group. The following soils are in the group:

- Bodine cherty silt loam, 5 to 12 percent slopes.
- Bodine cherty silt loam, 12 to 35 percent slopes.
- Bodine-Guin complex, 20 to 35 percent slopes.
- Colbert-Talbott very rocky clays, 8 to 25 percent slopes.
- Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes.
- Gravelly alluvial land.
- Gullied land, clayey materials.
- Gullied land, loamy materials.
- Gullied land, sandy materials.
- Rock land.
- Saffell gravelly sandy loam, 5 to 12 percent slopes.
- Saffell gravelly sandy loam, 12 to 20 percent slopes.
- Waynesboro very gravelly sandy loam, 5 to 12 percent slopes.
- Waynesboro very gravelly sandy loam, 12 to 25 percent slopes.
- Waynesboro very gravelly sandy loam, 25 to 45 percent slopes.

The soils in this group range from silt loam to clay in texture. They are low in fertility and in moisture-supplying capacity. These soils are mildly alkaline to very strongly acid. Most of the soils have slopes that range between 5 and 45 percent, but Gravelly alluvial land has slopes of 0 to 3 percent.

The Bodine soils and the soils of the Bodine-Guin complex are shallow and cherty. They are droughty, except in small areas on the lower parts of slopes where colluvial materials have accumulated. Outcrops of limestone are common in the Colbert-Talbott soils and in Rock land. Between the rocks the soil is fairly deep, and trees grow there. Gravelly alluvial land consists of cherty materials laid down by streams. Gullied land is made up of all gullied areas in the county. The Saffell soils are gravelly, and from 15 to 75 percent of the Waynesboro soils consists of gravel.

The soils in this group are suitable for hardwoods and conifers. Desirable species are listed in table 3.

Mixed hardwoods grow on the upper side slopes of the Bodine soils and of soils of the Bodine-Guin complex. In these places the soils are drier than on the lower slopes and on the floors of valleys where yellow-poplar and oaks

of high quality are predominant. Hardwoods grow better on the north-facing slopes in this group than on the south-facing slopes, and the drier areas are better suited to white oak than to red oak.

The Colbert-Talbott soils and Rock land are suited to redcedar. Growth of hardwoods on these sites is fair to good if overcutting or grazing has not caused the stands to be understocked. The hardwoods can be improved by removing the poorly formed, less desirable trees, thus making room for the better formed trees. Redcedar should be encouraged on the higher areas of these soils, and black walnut on the lower, more moist sites.

Gravelly alluvial land should be planted to trees where feasible. The trees help to prevent removal of soil by floodwaters. Areas of Gravelly alluvial land are best suited to sycamore and cottonwood, but loblolly pine can be grown on sites that have sufficient soil material.

Gullied land is best suited to shortleaf or loblolly pines. In a few places the native hardwoods can be removed by cutting or by chemicals to make room for growth of the desirable trees. In some places the soil is severely eroded and soil material will need to be added to the site before seedlings can be planted.

Waynesboro soils are in shortleaf pine and hardwoods. Cutting of the stands should be done so as to leave enough trees for restocking. Where the stands are understocked, interplanting may be needed. Open areas can be planted to shortleaf pine.

In general, it is best to remove trees of low quality to provide room for growth of the more desirable trees and natural regeneration of the stand. Lobolly pine can be planted on the tops of ridges.

Competition from other plants is most severe on the Waynesboro soils because sprouts of hawthorn and other shrubs encroach and use the limited supply of moisture.

The use of farm equipment is limited on soils of this group because the sites are mostly fairly steep and the valleys are narrow and V-shaped. Also, roots of trees are likely to be damaged if machinery is used. In places rocks and gullies hinder the use of the equipment that is commonly used in logging.

Mortality of seedlings is greater on this group of soils than on the soils in the other woodland groups. From 25 to 50 percent of the seedlings planted are lost. Replanting may be needed.

Because of the shallowness of these soils and the location of the sites, the hazard of windthrow is moderate to severe. The stands require careful cutting to prevent leaving openings that will allow ice or wind to damage the trees still standing.

Uses of Soils for Wildlife[3]

The suitability of different areas in Hardin County for wildlife are discussed in this section. Desirable species of game in the county are bobwhite, mourning dove, wild duck, wild geese, wild turkey, cottontail rabbit, squirrel, and deer. There are also many kinds of nongame birds and small mammals that depend on farmlands for food, water, and shelter.

Game and fish are an important source of recreation in the county. They can be encouraged to live in a particular area if suitable practices are used in managing the soils, plants, and water. The resulting benefits will help to protect the soil and conserve water.

The kind of habitat needed varies with the particular kind of wildlife. Some species like to live in woodlands; others prefer open farmland. Fish, ducks, and some other kinds of wildlife require a watery habitat. The landowner can obtain information from the Tennessee Game and Fish Commission and from the Soil Conservation District about practices that will help to support game and fish. The kinds of habitat preferred by the significant species of wildlife in Hardin County are discussed in the following pages.

Bobwhite like corn, cowpeas, soybeans, lespedeza—annual, bicolor, and japonica—and seeds of browntop millet, tickclover and vetch. They also like acorns; the seeds of pine, croton, and sweetgum; the fruit of blackberries, dogwoods, and mulberries; and insects. They prefer to feed in areas that are close to safe cover. In this way they are sheltered from the sun and adverse weather and are protected from predators. The most suitable areas for the bobwhite in this county are the Paden-Pickwick-Waynesboro, the Ennis-Lobelville-Humphreys, and the Wolftever-Beason-Egam soil associations.

Mourning dove prefer browntop millet, corn, and wheat. They also like the seeds of bull paspalum, pokeberry, and common ragweed, and the seeds of croton, pine, and sweetgum. They eat no insects. This bird picks its food off the ground where there is little vegetation. It requires water daily. In this county the Paden-Pickwick-Waynesboro, the Ennis-Lobelville-Humphreys, and the Wolftever-Beason-Egam soil associations are the best areas for dove.

Wild duck like acorns, corn, browntop millet, Japanese millet, and smartweed. The food can be grown in fields or woods on the bottom lands, and duck can be attracted by flooding the areas. Soil areas selected for flooding should have a slope of less than 2 percent, be slowly permeable, or have a high water table from October to March. Suitable soils in Hardin County are the Beason, Dunning, Egam, Falaya, Lee, Mantachie, Melvin, Newark, Robertsville, Taft, and Waverly.

Wild geese prefer corn and other grains. They graze clover, rye, ryegrass, wheat, and other green winter crops. These migratory birds use areas of water for resting and drinking.

Wild turkey thrive only in areas of woodland that are 1,000 acres or larger. They eat insects, acorns, grapes, seeds of grasses and pines, and green forage in winter and spring. This bird requires water daily. The best areas for wild turkey in Hardin County are the Shubuta-Waynesboro-Bodine and the Shubuta-Silerton-Dulac soil associations.

Cottontail rabbit like brushy areas that are interspersed with grass. This animal is the primary food of many kinds of predators. It needs a brushy cover to provide shelter from them. Growing clover, winter grain, or grass near the brush will provide food for the rabbit. Most parts of the county can provide a suitable habitat for rabbits.

Squirrel generally prefer wooded areas where there are trees that bear acorns, pecans, walnuts, hickory nuts, black cherries or mulberries and that are interspersed with pine. They also like corn. Squirrel nest in trees and prefer to use den holes in the trees.

[3] By Floyd R. Fessler, biologist, Soil Conservation Service.

Deer live chiefly in the wooded areas of the county. They feed on the tender growth of grasses, herbs, shrubs, vines, and trees. Acorns, corn, and soybeans are also foods they like. Deer drink water frequently. Because of the large proportion of woodland, the most suitable area in the county for deer is the Shubuta-Waynesboro-Bodine soil association.

Fish thrive in the warm waters of Hardin County. The most common are largemouth bass, bluegill, redear sunfish, channel catfish, buffalo, and minnows for bait. Fish are most abundant in water that is fertile and provides abundant food. Supplementary feeding can be provided to help increase the number of fish. Ponds, lakes, and reservoirs for fish can be constructed in all areas of the county.

Engineering Uses of the Soils[4]

This section contains information that will help engineers to select sites for buildings for residential, industrial, and other purposes; to choose locations for highways; to determine the trafficability of soils; and to locate sand, gravel, and rock for use in construction. It will also help in planning dams, ponds, and other structures to control floods and to conserve soil and water.

The soil map and accompanying report are too generalized for some engineering purposes. They should be used only in planning more detailed engineering field surveys to determine the in-place condition of soils at the site of the proposed engineering structure.

At many construction sites there are major variations in the soils within the depth of the proposed excavation, and several different kinds of soils occur within short distances. The soil maps and the profile descriptions, as well as the engineering data given in this section, should be used in planning a detailed survey of the soils at the site where construction is planned. By using the information in the soil survey report, the soils engineer can concentrate on the most suitable soil units. Then, a minimum number of soil samples will be needed for laboratory testing, and an adequate investigation can be made at a minimum cost.

Some of the terms used by the soil scientist may not be familiar to the engineer; other terms, though familiar, have special meanings in soil science. The terms used in the three tables, and other special terms used in the report, are defined in the Glossary at the back of the report.

Engineering classification systems

The United States Department of Agriculture system of classifying soil texture is used by agricultural scientists (*11*). In some ways this system of classifying soils is comparable to the systems engineers use in classifying soils. The systems used by engineers are explained briefly in the paragraphs that follow.

Most highway engineers classify soil materials in accordance with the AASHO method (*1*). In this system soil materials are classified in seven principal groups. The groups range from A–1, which consists of gravelly soils of high bearing capacity, to A–7, which consists of clayey soils having low strength when wet. Within each of the principal groups the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best material to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol.

Some engineers prefer the Unified soil classification system (*9*). In this system soil materials are identified as coarse grained, 8 classes; fine grained, 6 classes; and highly organic.

The classification of a soil material by either the AASHO or the Unified system identifies that soil material with regard to gradation and plasticity characteristics. The classification permits the engineer to make a rapid appraisal of this soil material through association with more familiar soils that have the same classification.

Engineering interpretations

The engineer should know the physical properties of the soil material and the in-place condition of the soils. This will help him in making best use of the soil maps and the soil survey report. After he has tested the soils and has observed their behavior in structures and foundations, an engineer can estimate design requirements for the different soils shown on the map. Tables 6 and 7 give a summary of the physical properties of the different soils and their suitability for engineering uses.

Table 6 gives a brief description of the site and characteristics of each soil in the county and its estimated physical properties. Estimates are given of properties for each significant layer of a typical profile, generally for each soil series, and the depth from the surface is given in inches. More complete descriptions of the profiles are given in the section "Descriptions of the Soils." Also given are classifications by the textural classes of the United States Department of Agriculture, as well as estimates of the Unified Classification of the material and the classification used by the American Association of State Highway Officials.

Depth to the seasonally high water table is based on field observations. Comparisons between depth to bedrock and depth to the water table show that in some places the water table lies within the bedrock. This is possible in pervious sedimentary deposits and cavernous limestone.

In table 6 the columns show the amount of material passing through a No. 4, a No. 10, and a No. 200 sieve. They denote the percentage of soil material that is smaller in diameter than the openings of the given screen.

In the column that shows permeability is given an estimate of the probable rate of water percolation; the rate is expressed in inches per hour. Permeability is estimated for uncompacted soil material. The estimates are based on structure and consistence and on field observations; only a limited amount of laboratory data is available.

The column that shows available water capacity gives the amount of water in inches per inch of soil depth that is held in the root zone and is available to a crop. It is an approximation of the capillary water when the soil is wet to field capacity and is the amount of water held in the soil between ⅓ and 15 atmospheres tension. If the soil is at permanent wilting point, this amount of water will wet it to a depth of 1 inch. Laboratory data are available for a few of the soils in Hardin County; for the others, estimates are based on data for similar soils.

The column for reaction shows the pH value of the soils in the county before liming.

[4] By NORMAN YOUNG, soils engineer, Materials and Test Division, Tennessee Department of Highways and Public Works.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
Am	Almo silt loam	0	30+	Poorly drained soil on stream terraces; developed in about 6 feet of silty material underlain by coastal plain clay or sandy clay; the silty materials are from loess.	0–10 10–22 22–55	Silt loam Silty clay loam Silty clay loam
Ba	Beason silt loam	0	30+	Somewhat poorly drained soil on nearly level low terraces, mainly on the flood plains of the Tennessee River.	0–7 7–18 18–63	Silt loam Silty clay loam Silty clay
BdD BdF	Bodine cherty silt loam, 5 to 12 percent slopes. Bodine cherty silt loam, 12 to 35 percent slopes.	30+	5–30	Excessively drained, cherty soils on rolling to steep uplands; developed in material weathered from cherty limestone; chert fragments are as much as 5 inches in diameter.	0–9 9–50	Cherty silt loam Cherty silty clay loam.
BeF	Bodine-Guin complex, 20 to 35 percent slopes.	30	5–30	Mixture of cherty and gravelly soils on rolling to steep uplands; Bodine soil similar to Bodine cherty silt loams (BdD, BdF); Guin soil is much like Bodine but is sandy loam throughout, contains gravel instead of chert, and is 8 to 10 inches deep to beds of gravel.	(2)	(2)
BfC BfD	Boswell fine sandy loam, 2 to 8 percent slopes. Boswell fine sandy loam, 8 to 12 percent slopes.	20+	30+	Moderately well drained or well drained soils on rolling uplands; developed in acid coastal plain clay; in places stratified sand and clay at a depth below 5 feet.	0–6 6–60	Fine sandy loam Clay
BoC3 BoD3	Boswell silty clay, 2 to 8 percent slopes, severely eroded. Boswell silty clay, 8 to 12 per-, cent slopes, severely eroded.	20+	30+	Moderately well drained or well drained soils on rolling uplands; developed in acid coastal plain clay; in places stratified sand and clay is at a depth below 5 feet.	0–6 6–60	Silty clay Clay
BpE2	Boswell soils, 12 to 25 percent slopes, eroded.	20+	30+	Well-drained soils on hilly and steep uplands; developed from acid coastal plain clay; in places stratified sand and clay is at a depth below 3 or 4 feet.	0–6 6–60	Fine sandy loam Clay
BrC BrD	Brandon silt loam, 5 to 8 percent slopes. Brandon silt loam, 8 to 12 percent slopes.	20+	30+	Well-drained soils on rolling uplands; developed in about 2 feet of loess overlying coastal plain materials; beds of gravel that have a small amount of sandy soil material commonly are at a depth of about 34 inches.	0–12 12–34 34+	Silt loam Silty clay loam Beds of gravel
Bu	Bruno loamy fine sand	0–5	30+	Excessively drained, sandy soil on nearly level bottoms; generally is in narrow areas parallel to the stream channels.	0–40	Loamy fine sand
CaA CaB2	Captina silt loam, 0 to 2 percent slopes. Captina silt loam, 2 to 5 percent slopes, eroded.	2	10–30+	Moderately well drained soils on low terraces; developed in mixed materials, mainly from limestone; fragipan or compacted layer at a depth of 2 feet.	0–9 9–28 28–60	Silt loam Silty clay loam Silty clay loam or silt loam.
CbB3	Captina silty clay loam, 2 to 8 percent slopes, severely eroded.	1½–2	10–30+	Moderately well drained soil on low terraces; developed in mixed materials, mainly from limestone; fragipan or compacted layer at a depth between 1 and 2 feet.	0–22 22–60	Silty clay loam Silty clay loam or silt loam.

See footnotes at end of table.

their estimated physical properties

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
ML	A-4	100	100	70-90	0. 2-0. 8	0. 20-0. 25	5. 1-5. 5	High	Low.
ML or CL	A-6	100	100	85-95	0. 2-0. 8	0. 20-0. 25	5. 1-5. 5	Moderate	Moderate.
ML or CL	A-6	100	100	85-95	<0. 2	0. 15-0. 20	5. 1-5. 5	Moderate	Moderate.
ML	A-4	100	100	75-90	0. 2-0. 8	0. 20-0. 25	5. 1-6. 0	High	Low.
ML or CL	A-6	100	100	85-95	0. 2-0. 8	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
CL or CH	A-7	100	100	85-95	0. 2-0. 8	0. 15-0. 20	5. 1-5. 5	Moderate	Moderate.
GM or ML	A-4 or A-2	45-75	40-70	30-65	2. 5-5. 0	0. 05-0. 10	4. 5-5. 5	Moderate	Low.
GM	A-1 or A-2	25-50	20-40	15-35	2. 5-5. 0	0. 05-0. 10	4. 5-5. 0	Moderate	Low.
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ML	A-4	95-100	90-100	60-90	0. 8-2. 5	0. 15-0. 20	4. 5-5. 5	High	Low.
MH or CH	A-7	95-100	90-100	75-95	0. 2-0. 8	0. 10-0. 15	4. 5-5. 5	Low	High.
MH or CH	A-7	95-100	90-100	75-95	0. 2-0. 8	0. 10-0. 15	4. 5-5. 5	Low	High.
MH or CH	A-7	95-100	90-100	75-95	0. 2-0. 8	0. 10-0. 15	4. 5-5. 5	Low	High.
ML	A-4	95-100	90-100	60-90	0. 8-2. 5	0. 15-0. 20	4. 5-5. 5	High	Low.
MH or CH	A-7	95-100	90-100	75-95	0. 2-0. 8	0-10-0. 15	4. 5-5. 5	Low	High.
ML	A-4	95-100	90-100	70-90	0. 2-2. 5	0. 20-0. 25	4. 5-5. 5	High	Low.
ML or CL	A-6	95-100	90-100	85-95	0. 2-0. 8	0. 15-0. 20	4. 5-5. 0	Moderate	Moderate.
GM	A-1 or A-2	15-40	10-30	5-25	5. 0-10. 0	<0. 05	4. 5-5. 0	Low	Low.
SM	A-2	95-100	85-100	10-25	5. 0-10. 0	0. 05-0. 10	5. 1-6. 0	High	Low.
ML	A-4	95-100	90-100	75-95	0. 2-2. 5	0. 20-0. 25	5. 1-6. 0	High	Low.
ML or CL	A-6	95-100	90-100	80-95	0. 2-0. 8	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
ML or CL	A-6	95-100	90-100	80-95	<0. 2	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
ML or CL	A-6	95-100	90-100	80-95	0. 2-0. 8	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
ML or CL	A-6	95-100	90-100	80-95	<0. 2	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
CcD CcE	Colbert silty clay loam, 5 to 12 percent slopes. Colbert silty clay loam, 12 to 25 percent slopes.	10+	0–2. 0	Well drained to moderately well drained, fine-textured soils on low, rolling hills; shallow over clayey limestone bedrock; bedrock outcrops are common.	0–6 6–24	Silty clay loam Clay
CdE	Colbert-Talbott very rocky clays, 8 to 25 percent slopes.	10+	0–2. 0	Fine-textured soils, with many limestone bedrock outcrops, on rolling to steep uplands; depth of soil material between the rock ledges is variable.	(2)	Clay
CeE	Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes.	10+	0–2. 0	Fine-textured soils, with many limestone bedrock outcrops, on rolling to steep uplands; depth of soil material between the rock ledges is variable.	(2)	Clay
Cf	Collins fine sandy loam	0	30+	Well-drained soil on nearly level bottoms; consists of mixed alluvium from loess and coastal plain materials.	0–40	Fine sandy loam
Cg	Collins loam, local alluvium	0	30+	Well-drained soil in narrow strips along small drainageways; consists of young local alluvium.	0–40	Loam
Ch	Collins silt loam	0	30+	Well-drained soil on nearly level bottom land; consists of mixed alluvium from loess and coastal plain materials.	0–40	Silt loam
CkD CkF	Culleoka silt loam, 5 to 12 percent slopes. Culleoka silt loam, 12 to 35 percent slopes.	10+	2–8	Well-drained soils on rolling to steep uplands; underlain by sandstone bedrock that is phosphatic.	0–6 6–30	Silt loam Silty clay loam
CnE CnF	Cuthbert fine sandy loam, 12 to 25 percent slopes. Cuthbert fine sandy loam, 25 to 35 percent slopes.	20+	30+	Well-drained soils on uplands; developed in coastal plain materials; underlying material is alternating layers of sand and clay; substratum contains a variable number of layers of ironstone that are 1 to 6 inches thick.	0–5 5–36	Fine sandy loam Sandy clay
CrF	Cuthbert-Ruston complex, 12 to 35 percent slopes.	20+	30+	Well-drained soils on uplands; developed in coastal plain materials; Cuthbert developed in sandy clay materials, and Ruston in sandy materials.	(2)	(2)
CsD	Cuthbert and Susquehanna soils, 5 to 12 percent slopes.	20+	30+	Well-drained soils on uplands; developed in coastal plain materials; Cuthbert developed in sandy clay, and Susquehanna in clay; thin layers or ironstone are in the substratum.	(2)	Fine sandy loam over clay or sandy clay.
DaD DaF	Dandridge-Needmore complex, 8 to 12 percent slopes. Dandridge-Needmore complex, 12 to 35 percent slopes.	10+	1–3	Well-drained soils on uplands; developed in material weathered from calcareous shale.	(2)	Silt loam and shaly silty clay.
DcB3 DcC3 DcD3	Dexter clay loam, 2 to 5 per- slopes, severely eroded. Dexter clay loam, 5 to 8 percent slopes, severely eroded. Dexter clay loam, 8 to 12 percent, slopes severely eroded.	10+	30+	Well-drained soils, chiefly on low terracelike positions; developed in mixed alluvium washed from loess and coastal plain materials.	0–30 30–50	Clay loam Sandy clay loam

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
MH or CH	A-7	95-100	90-100	75-90	0. 2-0. 8	0. 10-0. 15	5. 6-7. 3	Low	High.
CH	A-7	95-100	90-100	80-95	<0. 2	0. 05-0. 10	5. 6-7. 3	Low	High.
CH	A-7	95-100	90-100	85-95	0. 2-0. 8	0. 05-0. 10	5. 6-7. 3	Low	High.
CH	A-7	95-100	90-100	80-95	0. 2-0. 8	0. 05-0. 10	5. 1-7. 3	Low	High.
ML	A-4	100	100	50-70	0. 8-2. 5	0. 15-0. 20	5-1-6. 0	High	Low.
ML	A-4	100	100	60-80	0. 8-2. 5	0. 20-0. 25	5. 1-6. 0	High	Low.
ML	A-4	100	100	80-95	0. 2-0. 8	0. 20-0. 25	5. 1-6. 0	High	Low.
ML	A-4	90-100	85-95	65-85	0. 8-2. 5	0. 20-0. 25	5. 1-6. 5	High	Low.
ML or CL	A-6	90-100	85-95	80-90	0. 8-2. 5	0. 15-0. 25	5. 1-6. 5	Moderate	Moderate.
ML or SM	A-4	95-100	85-100	40-80	0. 8-2. 5	0. 15-0. 20	5. 1-6. 0	High	Low.
MH or CH	A-6 or A-7	95-100	85-100	55-85	0. 2-2. 5	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
ML, MH, CH, or SM.	A-4, A-6, A-7, A-2.	95-100	85-95	30-75		0. 15-0. 20			
ML, CL, MH, CH, or SM.	A-4, A-6, A-7, A-2.	95-100	85-95	30-70		0. 10-0. 20	5. 1-5. 5	Moderate to low.	Moderate to high.
ML, CL, MH, CH.	A-4, A-6, A-7.	85-95	70-90	55-80		0. 10-0. 20	5. 1-6. 5	Moderate	Moderate.
CL	A-4 or A-6	100	95-100	70-80	0. 8-2. 5	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
CL	A-4	100	95-100	65-75	0. 8-2. 5	0. 10-0. 20	5. 1-6. 0	Moderate	Moderate.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
DeB2	Dexter loam, 2 to 5 percent slopes, eroded.	10+	30+	Well-drained soils, chiefly in low terracelike positions; developed in mixed alluvium washed from loess and coastal plain materials.	0–8 8–38 38–50	Loam Clay loam Sandy clay loam
DeC2	Dexter loam, 5 to 8 percent slopes, eroded.					
DeD	Dexter loam, 8 to 12 percent slopes.					
DkB	Dulac silt loam, 2 to 5 percent slopes.	[3] 1–2	30+	Moderately well drained soils on uplands; developed in loess, 3½ to 6 feet thick, that overlies coastal plain sandy clay and clay.	0–8 8–42 42–60+	Silt loam Silty clay loam Sandy clay
DkB2	Dulac silt loam, 2 to 5 percent slopes, eroded.					
DkB3	Dulac silt loam, 2 to 5 percent slopes, severely eroded.					
DkC	Dulac silt loam, 5 to 8 percent slopes.					
DkC3	Dulac silt loam, 5 to 8 percent slopes, severely eroded.					
Du	Dunning silty clay loam	0	3–8	Poorly drained, fine-textured, black soil on nearly level bottom land.	0–18 18–42	Silty clay loam Silty clay
Ea	Egam silty clay loam	0	30+	Moderately well drained soil on nearly level bottom land; compact subsoil.	0–48	Silty clay loam
Ec	Ennis cherty silt loam	0	10–25	Well-drained, cherty soil on nearly level bottom land; material washed chiefly from cherty limestone uplands.	0–48	Cherty silt loam
Ee	Ennis cherty silt loam, local alluvium	0	10–25	Well-drained, cherty soil along narrow drainageways.	0–48	Cherty silt loam
Ef	Ennis fine sandy loam	0	10–25	Well-drained soil on nearly level bottom land.	0–48	Fine sandy loam
Em	Ennis silt loam	0	10–25	Well-drained soil on nearly level bottom land; fragments of chert below a depth of 30 inches.	0–48	Silt loam
En	Ennis silt loam, local alluvium	0	10–25	Well-drained soil in narrow areas along drainageways; few to many fragments of chert below a depth of 30 inches.	0–48	Silt loam
EtC3	Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded.	20	15–25	Well-drained, gravelly soils on high terraces.	0–42	Gravelly silty clay loam.
EtD3	Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded.					
Fa	Falaya loam, local alluvium	0	30+	Somewhat poorly drained soil in narrow areas along intermittent drainageways; local alluvium is from loess and coastal plain materials.	0–36	Loam
Fm	Falaya silt loam	0	30+	Somewhat poorly drained soil on nearly level bottom lands; consists of recent alluvium from loess and coastal plain materials.	0–36	Silt loam
FrB2	Freeland loam, 2 to 5 percent slopes, eroded.	[3] 1–2	30+	Moderately well drained soils on low terraces; a fragipan at a depth between 1½ and 2 feet; developed in old mixed alluvium washed from loess and coastal plain materials.	0–12 12–60	Loam Clay loam or silty clay loam.
FrB3	Freeland loam, 2 to 5 percent slopes, severely eroded.					
FrC2	Freeland loam, 5 to 8 percent slopes, eroded.					
FrC3	Freeland loam, 5 to 8 percent slopes, severely eroded.					

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
ML	A-4	100	95–100	65–75	0. 8–2. 5	0. 20–0. 25	5. 1–6. 0	High	Low.
CL	A-4 or A-6	100	95–100	70–80	0. 8–2. 5	0. 15–0. 20	5. 1–6. 0	Moderate	Moderate.
CL	A-4	100	95–100	65–75	0. 8–2. 5	0. 10–0. 20	5. 1–6. 0	Moderate	Moderate.
ML	A-4	100	95–100	80–95	0. 2–2. 5	0. 20–0. 25	4. 5–5. 5	High	Low.
CL	A-6 or A-7	100	95–100	80–95	0. 2–0. 8	0. 15–0. 25	4. 5–5. 5	Moderate	Moderate.
CL	A-6 or A-7	100	95–100	80–95	<0. 2	0. 15–0. 20	4. 5–5. 5	Low	Moderate.
ML or CL	A-6 or A-7	100	90–100	80–95	0. 2–0. 8	0. 15–0. 20	5. 6–6. 5	Low	High.
MH or CH	A-7	100	90–100	85–95	<0. 2	0. 15–0. 20	5. 6–6. 5	Low	High.
ML or CL	A-4 or A-6	95–100	90–100	70–90	0. 2–0. 8	0. 15–0. 20	5. 6–6. 5	Moderate	Moderate.
GM or ML	A-4	65–90	55–85	40–70	0. 8–2. 5	0. 10–0. 20	5. 1–6. 0	High	Low.
GM or ML	A-4	65–90	55–85	40–70	0. 8–2. 5	0. 10–0. 25	5. 1–6. 0	High	Low.
ML	A-4	95–100	90–100	55–85	0. 8–2. 5	0. 10–0. 20	5. 1–6. 0	High	Low.
ML	A-4	95–100	90–100	80–95	0. 2–2. 5	0. 20–0. 25	5. 1–6. 0	High	Low.
ML	A-4	95–100	90–100	80–95	0. 2–2. 5	0. 20–0. 25	5. 1–6. 0	High	Low.
GM, ML, or CL.	A-4 or A-2	45–85	35–85	25–70	0. 2–2. 5	0. 10–0. 20	5. 1–5. 5	Moderate	Moderate.
ML	A-4	100	100	50–80	0. 8–2. 5	0. 20–0. 25	5. 1–6. 0	High	Low.
ML	A-4	100	100	50–95	0. 2–0. 8	0. 20–0. 25	5. 1–6. 0	High	Low.
ML	A-4	100	95–100	65–75	0. 2–2. 5	0. 15–0. 25	5. 1–5. 5	High	Low.
ML or CL	A-6	100	95–100	75–85	<0. 2–0. 8	0. 15–0. 20	5. 1–5. 5	Moderate	Moderate.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
Ga	Gravelly alluvial land	20	15–25	Nearly level soils along small streams; high content of rounded and angular gravel.	(2)	Mixture of sand, silt, and gravel.
Gc	Gullied land, clayey materials	20+	15–30+	Land that has many shallow and deep gullies; most of the gullies cannot be crossed by light farm machinery; the texture of the soil material varies greatly, partly because of the depth of the gullies.	(2)	Clay to sandy clay.
Gm	Gullied land, loamy materials					Silty clay loam to sandy clay loam.
Gs	Gullied land, sandy materials					Sandy clay loam
Ha	Hatchie loam	[3] 1–2	30+	Somewhat poorly drained soil on low terraces; developed in mixed alluvium washed from loess and coastal plain materials.	0–12	Loam
					12–40	Silty clay loam
					40–60	Clay loam
HcB2	Humphreys cherty silt loam, 2 to 5 percent slopes, eroded.	4–6	10–25	Well-drained, cherty soil on low terraces; the soil material is mainly from cherty limestone.	0–15	Cherty silt loam
					15–45	Cherty silty clay loam.
HmB2	Humphreys silt loam, 2 to 5 percent slopes, eroded.	4–6	10–25	Well-drained soil on low terraces; the soil material is mainly from limestone.	0–15	Silt loam
					15–45	Silty clay loam
Hn	Huntington fine sandy loam	0	30+	Well-drained soil on nearly level bottom land; the soil material is alluvium, mainly from limestone.	0–45	Fine sandy loam
Hu	Huntington silt loam	0	30+	Well-drained soil on nearly level bottom land; the soil material is alluvium, mainly from limestone.	0–45	Silt loam
LaD2	Landisburg cherty silt loam, 5 to 12 percent slopes, eroded.	1. 5–2. 5	5–15	Moderately well drained, cherty soils on foot slopes; developed in colluvium or local alluvium from cherty limestone; has a fragipan at a depth of 2 feet and a seasonally perched water table.	0–14	Cherty silt loam
LaE	Landisburg cherty silt loam, 12 to 20 percent slopes.				14–64	Cherty silty clay loam.
LcD3	Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded.	1. 5–2. 0	3–15	Moderately well drained, cherty soil on foot slopes; developed in colluvium or local alluvium derived from cherty limestone; has a fragipan at a depth between 1 and 2 feet and a seasonally perched water table.	0–60	Cherty silty clay loam.
Le	Lee cherty silt loam	0	10–25	Poorly drained, cherty soil on level bottom land; consists of recent alluvium from cherty limestone.	0–50	Cherty silt loam
Lm	Lee silt loam	0	10–25	Poorly drained soil on level bottom land; consists of recent alluvium from limestone.	0–50	Silt loam
Ln	Lindside silt loam	0	30+	Moderately well drained soil on level bottom land; consists of recent alluvium, chiefly from limestone.	0–42	Silt loam
Ls	Lindside silty clay loam	0	30+	Moderately well drained soil on level bottom land; consists of recent alluvium, chiefly from limestone.	0–42	Silty clay loam

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
GM	A-1 or A-2	30-60	25-50	10-30	5.0-10.0	<0.10		Moderate	Low.
MH or CH	A-6 or A-7	95-100	85-100	65-95				Low	High.
ML or CL	A-4 or A-6	90-100	85-95	60-85				Moderate	Moderate.
ML or CL	A-4 or A-6	90-100	85-95	55-80				Moderate	Moderate.
ML	A-4	100	95-100	65-75	0.2-2.5	0.15-0.25	5.1-5.5	High	Low.
ML or CL	A-6 or A-7	100	95-100	75-85	0.2-0.8	0.15-0.25	5.1-5.5	Moderate	Moderate.
ML or CL	A-6 or A-7	100	95-100	75-85	<0.2	0.10-0.20	5.1-5.5	Moderate	Moderate.
ML or GM	A-4	75-90	65-85	45-75	0.8-2.5	0.10-0.20	5.1-6.0	High	Low.
CL	A-4 or A-6	75-90	65-85	55-80	0.8-2.5	0.10-0.15	5.1-6.0	Moderate	Moderate.
ML	A-4	80-100	70-95	60-90	0.2-2.5	0.10-0.25	5.1-6.0	High	Low.
CL	A-4 or A-6	80-100	70-95	65-90	0.2-2.5	0.15-0.25	5.1-6.0	Moderate	Moderate.
ML	A-4	100	90-100	50-70	0.8-2.5	0.15-0.20	6.1-6.5	High	Low.
ML	A-4	100	90-100	65-85	0.2-2.5	0.20-0.25	6.1-6.5	High	Low.
ML or GM	A-4	65-85	55-75	45-70	0.8-2.5	0.10-0.20	5.1-5.5	High	Low.
ML or CL	A-4	70-90	60-80	50-75	<0.2-0.8	0.10-0.15	5.1-5.5	Moderate	Moderate.
ML or CL	A-4	70-90	60-80	50-75	<0.2-0.8	0.10-0.15	5.1-5.5	High	Moderate.
ML or GM	A-4	65-80	55-75	45-70	0.8-2.5	0.10-0.20	5.1-5.5	High	Low.
ML	A-4	100	100	55-95	0.2-0.8	0.20-0.25	5.1-5.5	High	Low.
ML	A-4	100	100	55-95	0.2-0.8	0.20-0.25	5.5-6.5	Moderate	Low.
ML or CL	A-4 or A-6	100	100	55-95	0.2-0.8	0.15-0.25	5.5-6.5	Moderate	Low.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
Lt	Lobelville cherty silt loam	0	10–25	Moderately well drained to somewhat poorly drained, cherty soil on level bottom lands; consists of recent alluvium washed from cherty limestone material.	0–40	Cherty silt loam
Lv	Lobelville silt loam	0	10–25	Moderately well drained to somewhat poorly drained soil on level bottom land; consists of recent alluvium washed chiefly from limestone material.	0–40	Silt loam
MaC MaD MaE	Magnolia fine sandy loam, 5 to 8 percent slopes. Magnolia fine sandy loam, 8 to 12 percent slopes. Magnolia fine sandy loam, 12 to 25 percent slopes.	30+	30+	Well-drained soils on uplands; developed in coastal plain sandy clay or sandy clay loam; underlain by stratified sand and clay.	0–8 8–12 12–50	Fine sandy loam Clay loam Sandy clay
Mc	Mantachie fine sandy loam	0	30+	Somewhat poorly drained soil on nearly level bottom land; consists of recent alluvium from loess and coastal plain materials.	0–36	Fine sandy loam
Me	Melvin and Newark silt loams	0	30+	Somewhat poorly drained to poorly drained soils on level bottom land; consists of recent alluvium washed chiefly from limestone material.	0–48	Silt loam
MhD MhE	Minvale cherty silt loam, 5 to 12 percent slopes. Minvale cherty silt loam, 12 to 25 percent slopes.	10–15	5–26	Well-drained soils on foot slopes; developed in colluvium from cherty limestone material.	0–14	Cherty silt loam Cherty silty clay loam.
MnD3 MnE3	Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded. Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded.	8–15	5–12	Well-drained, cherty soils on foot slopes; developed in colluvium from cherty limestone material.	0–48	Cherty silty clay loam.
MoC	Mountview silt loam, 5 to 8 percent slopes.	20+	7–30	Well-drained upland soil; developed in a thin mantle of loess underlain by cherty limestone material weathered from residuum.	0–11 11–44	Silt loam Silty clay loam
PaB PaB2 PaB3 PaC PaC2 PaC3 Pc	Paden silt loam, 2 to 5 percent slopes. Paden silt loam, 2 to 5 percent slopes, eroded. Paden silt loam, 2 to 5 percent slopes, severely eroded. Paden silt loam, 5 to 8 percent slopes. Paden silt loam, 5 to 8 percent slopes, eroded. Paden silt loam, 5 to 8 percent slopes, severely eroded. Paden-gullied land complex.	[3] 1–2	30+	Moderately well drained soils; developed in about 4 feet of loess underlain by old alluvium; fragipan at a depth between 1½ and 2 feet, but in areas that are severely eroded the fragipan may be near or at the surface; the underlying old alluvium is predominantly sandy and gravelly material.	0–12 12–30 30–50	Silt loam Silty clay loam Silty clay loam
PkB PkB2 PkC	Pickwick silt loam, 2 to 5 percent slopes. Pickwick silt loam, 2 to 5 percent slopes, eroded. Pickwick silt loam, 5 to 8 percent slopes.	30+	30+	Well-drained soils on uplands; developed in about 4 feet of loess underlain by old alluvium that is sandy and gravelly.	0–10 10–48	Silt loam Silty clay loam to clay loam.

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
GM or ML	A-4	65–90	55–85	40–70	0. 8–2. 5	0. 10–0. 20	5. 1–6. 0	High	Low.
ML	A-4	100	90–100	80–90	0. 2–0. 8	0. 20–0. 25	5. 1–6. 0	High	Low.
ML	A-4	95–100	90–100	60–90	0. 8–2. 5	0. 15–0. 20	5. 1–5. 5	High	Low.
CL	A-6	95–100	90–100	50–85	0. 2–0. 8	0. 15–0. 20	5. 1–5. 5	Moderate	Moderate.
MH or CH	A-7	95–100	90–100	50–85	0. 2–0. 8	0. 15–0. 20	5. 1–5. 5	Low	Moderate.
ML	A-4	100	100	50–70	0. 8–2. 5	0. 15–0. 20	5. 1–6. 0	High	Low.
ML	A-4	100	90–100	80–95	0. 2–0. 8	0. 20–0. 25	5. 6–6. 5	High	Low.
ML or GM	A-4	65–90	55–85	45–70	0. 8–2. 5	0. 10–0. 20	5. 1–5. 5	High	Low.
ML or CL	A-6	70–90	60–85	50–75	0. 8–2. 5	0. 10–0. 20	5. 1–5. 5	Moderate	Moderate.
ML or CL	A-6	70–90	60–85	50–75	0. 8–2. 5	0. 10–0. 20	5. 1–5. 5	Moderate	Moderate.
ML	A-4	100	95–100	85–95	0. 8–2. 5	0. 20–0. 25	5. 1–5. 5	High	Low.
ML or CL	A-6 or A-7	100	95–100	85–100	0. 2–0. 8	0. 15–0. 20	5. 1–5. 5	Moderate	Moderate.
ML	A-4	100	100	75–90	0. 2–2. 5	0. 20–0. 25	5. 1–5. 5	High	Low.
ML or CL	A-6 or A-7	90–100	90–100	85–95	0. 2–0. 8	0. 15–0. 25	5. 1–5. 5	Moderate	Moderate.
ML or CL	A-6 or A-7	90–100	90–100	85–95	<0. 2	0. 15–0. 20	5. 1–5. 5		
ML	A-4	100	95–100	65–90	0. 8–2. 5	0. 20–0. 30	5. 1–5. 5	Moderate	Low.
ML or CL	A-6	85–100	85–100	75–90	0. 8–2. 5	0. 15–0. 20	5. 1–5. 5	Moderate	Moderate.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
PkC2	Pickwick silt loam, 5 to 8 percent slopes, eroded.					
PkD	Pickwick silt loam, 8 to 12 percent slopes.					
PkE	Pickwick silt loam, 12 to 25 percent slopes.					
PwB3	Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded.	30+	30+	Well-drained soils on uplands; developed in about 4 feet of loess overlying old alluvium that is sandy and gravelly.	0–48	Silty clay loam
PwC3	Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded.					
PwD3	Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded.					
PwE3	Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded.					
Px	Pickwick-gullied land complex					
Rb	Robertsville silt loam	0	30+	Poorly drained, gray soil; developed in medium- and fine-textured mixed alluvium.	0–8 8–46 46–60	Silt loam Silty clay loam Silty clay loam
Rc	Rock land	30+	0–1	Land that has many limestone outcrops; there is fine-textured soil material between the rock ledges.		
RfC	Ruston fine sandy loam, 5 to 8 percent slopes.	30+	30+	Well-drained soils on uplands; developed in sandy coastal plain materials.	0–14 14–34 34–60	Fine sandy loam Sandy clay loam Sandy loam
RfD	Ruston fine sandy loam, 8 to 12 percent slopes.					
RfE	Ruston fine sandy loam, 12 to 25 percent slopes.					
RfF	Ruston fine sandy loam, 25 to 45 percent slopes.					
RuD3	Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded.	30+	30+	Well-drained soils on uplands; developed in sandy coastal plain materials.	0–34 34–60	Sandy clay loam Sandy loam
RuE3	Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded.					
SaD	Saffell gravelly sandy loam, 5 to 12 percent slopes.	30+	30+	Well-drained to somewhat excessively drained soils; developed in gravelly coastal plain materials; beds of gravel at a depth between 2 and 4 feet.	0–7 7–24	Gravelly sandy loam. Gravelly sandy loam.
SaE	Saffell gravelly sandy loam, 12 to 20 percent slopes.					
ScA	Sequatchie fine sandy loam, 0 to 2 percent slopes.	0–5	30+	Well-drained soils on low terraces; developed in mixed alluvium, mainly from limestone materials.	0–18 18–38 38–60	Fine sandy loam Clay loam Sandy loam
ScB2	Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded.					
SeC3	Sequatchie loam, 2 to 8 percent slopes, severely eroded.	0–5	30+	Well-drained soil on low terraces; developed in mixed alluvium, mainly from limestone materials.	0–6 6–30 30–60	Loam Clay loam Sandy loam
ShC3	Shubuta clay loam, 5 to 8 percent slopes, severely eroded.	30+	30+	Well-drained soils on uplands; developed in coastal plain sandy clay; underlain by sand and clay.	0–12 12–40	Clay loam Sandy clay
ShD3	Shubuta clay loam, 8 to 12 percent slopes, severely eroded.					
ShE3	Shubuta clay loam, 12 to 25 percent slopes, severely eroded.					
Sp	Shubuta-gullied land complex.					

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
ML or CL	A-6	85-100	85-100	75-90	0. 2-2. 5	0. 15-0. 25	5. 1-5. 5	Moderate	Moderate.
ML	A-4	100	95-100	80-95	0. 2-0. 8	0. 20-0. 25	4. 5-5. 0	Moderate	Moderate.
MH or CH	A-6 or A-7	100	95-100	85-95	0. 2-0. 8	0. 20-0. 25	4. 5-5. 0	Low	High.
MH or CH	A-6 or A-7	100	95-100	85-95	<0. 2	0. 15-0. 20	4. 5-5. 0	Low	High.
ML or SM	A-4	95-100	90-100	35-60	0. 8-2. 5	0. 15-0. 20	4. 5-5. 0	High	Low.
ML or SM	A-4	95-100	90-100	40-65	0. 8-2. 5	0. 15-0. 20	4. 5-5. 0	Moderate	Moderate.
SM or SC	A-4	95-100	90-100	35-50	0. 8-2. 5	0. 10-0. 15	4. 5-5. 0	Moderate	Moderate.
ML or SM	A-4	100	90-100	45-60	0. 8-2. 5	0. 15-0. 20	4. 5-5. 0	Moderate	Moderate.
SM or SC	A-4	100	90-100	40-50	0. 8-2. 5	0. 10-0. 15	4. 5-5. 0	Moderate	Moderate.
GM or GC	A-2	40-55	35-50	20-35	2. 5-5. 0	0. 05-0. 15	4. 5-5. 0	High	Low.
GM or GC	A-2	35-50	30-45	15-35	2. 5-5. 0	0. 05-0. 10	4. 5-5. 0	High	Low.
ML or SM	A-4	95-100	90-100	40-65	0. 8-2. 5	0. 15-0. 20	5. 1-6. 0	Moderate	Low.
ML or CL	A-4 or A-6	95-100	90-100	60-75	0. 8-2. 5	0. 15-0. 20	5. 1-6. 0	Moderate	Moderate.
CL or SM	A-4 or A-6	95-100	90-100	35-60	0. 8-5. 0	0. 10-0. 15	5. 1-6. 0	Moderate	Low.
ML	A-4	95-100	90-100	55-75	0. 8-2. 5	0. 20-0. 25	5. 1-6. 0	Moderate	Low.
ML or CL	A-4 or A-6	95-100	90-100	65-85	0. 8-2. 5	0. 20-0. 25	5. 1-6. 0	Moderate	Moderate.
ML or CL	A-4 or A-6	95-100	90-100	55-75	0. 8-2. 5	0. 10-0. 15	5. 1-6. 0	Moderate	Low.
ML, MH	A-4, A-6, A-7.	95-100	90-100	50-80	0. 2-0. 8	0. 15-0. 20	4. 5-5. 0	Moderate	Moderate.
ML, MH	A-4, A-6, A-7.	95-100	90-100	50-85	0. 2-0. 8	0. 10-0. 15	4. 5-5. 0	Low to moderate.	Moderate.

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TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
SmC	Shubuta fine sandy loam, 5 to 8 percent slopes.	30+	30+	Well-drained soils on uplands; developed in coastal plains sandy clay; underlain by sand and clay.	0–7 7–12 12–40	Fine sandy loam Clay loam Sandy clay
SmC2	Shubuta fine sandy loam, 5 to 8 percent slopes, eroded.					
SmD	Shubuta fine sandy loam, 8 to 12 percent slopes.					
SmE	Shubuta fine sandy loam, 12 to 25 percent slopes.					
SmF	Shubuta fine sandy loam, 25 to 45 percent slopes.					
SrB	Silerton silt loam, 2 to 5 percent slopes.	30+	30+	Well-drained soils on uplands; developed in a thin mantle of loess underlain by coastal plain sand and clay.	0–12 12–24 24–60	Silt loam Silty clay loam Sandy clay
SrB2	Silerton silt loam, 2 to 5 percent slopes, eroded.					
SrC	Silerton silt loam, 5 to 8 percent slopes.					
SrC2	Silerton silt loam, 5 to 8 percent slopes, eroded.					
SrD	Silerton silt loam, 8 to 12 percent slopes.					
SsB3	Silerton silty clay loam, 2 to 5 percent slopes, severely eroded.	30+	30+	Well-drained soils on uplands; developed in a thin mantle of loess underlain by coastal plain sand and clay.	0–18 18–60	Silty clay loam Sandy clay
SsC3	Silerton silty clay loam, 5 to 8 percent slopes, severely eroded.					
SsD3	Silerton silty clay loam, 8 to 12 percent slopes, severely eroded.					
SuD2	Sumter silty clay, 5 to 12 percent slopes, eroded.	30+	30+	Well-drained soils on low, choppy hills; developed in alkaline coastal plain clay.	0–10 10–24	Clay or silty clay ------
SuF2	Sumter silty clay, 12 to 35 percent slopes, eroded.					
Sw	Swamp	0	30+	Land that is flooded much or most of the time; the soil is recent mixed alluvium from loess and coastal plain materials.	------	------
Ta	Taft silt loam	[3] 0	30+	Somewhat poorly drained soil on nearly level terraces; developed in old alluvium, chiefly from limestone material.	0–8 8–24 24–42	Silt loam Silt loam or silty clay loam. Silty clay loam
TsB	Talbott silt loam, 2 to 5 percent slopes.	20–30	1. 5–5	Well-drained soils on uplands; developed in material weathered from clayey limestone; occasional limestone outcrops.	0–6 6–60	Silt loam Clay
TsC	Talbott silt loam, 5 to 8 percent slopes.					
TsD	Talbott silt loam, 8 to 12 percent slopes.					
TsE	Talbott silt loam, 12 to 25 percent slopes.					
TtC3	Talbott silty clay, 5 to 8 percent slopes, severely eroded.	20–30	1–5	Well-drained soils on uplands; developed in material weathered from clayey limestone; occasional limestone outcrops.	0–48	Clay or silty clay
TtE3	Talbott silty clay, 8 to 25 percent slopes, severely eroded.					
TbD	Talbott cherty silt loam, 5 to 12 percent slopes.	20+	5–15	Well-drained, cherty soils on uplands; subsoil is clayey; develloped in material weathered from cherty limestone.	0–6 6–10 10–54	Cherty silt loam Cherty silty clay loam. Cherty clay
TbE	Talbott cherty silt loam, 12to 25 percent slopes.					

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
ML or SM	A–4	95–100	90–100	35–70	0. 8–2. 5	0. 15–0. 20	4. 5–5. 0	High	Low.
ML, MH	A–4, A–6, A–7.	95–100	90–100	50–80	0. 2–0. 8	0. 15–0. 20	4. 5–5. 0	Moderate	Moderate.
ML, MH	A–4, A–6, A–7.	95–100	90–100	50–85	0. 2–0. 8	0. 10–0. 20	4. 5–5. 0	Moderate	Moderate.
ML or CL	A–4	100	100	90–100	0. 2–2. 5	0. 20–0. 25	4. 5–5. 0	High	Low.
ML or CL	A–6 or A–7	100	100	90–100	0. 2–2. 5	0. 15–0. 25	4. 5–5. 0	Moderate	Moderate.
ML, CL, CH	A–6 or A–7	90–100	85–100	80–100	0. 2–0. 8	0. 15–0. 20	4. 5–5. 0	Moderate to low.	Moderate.
ML or CL	A–6 or A–7	100	100	90–100	0. 2–2. 5	0. 15–0. 25	4. 5–5. 0	Moderate	Moderate.
ML, CL, MH	A–6 or A–7	90–100	85–100	80–100	0. 2–0. 8	0. 15–0. 20	4. 5–5. 0	Moderate to low.	Moderate.
CH or MH	A–7	100	100	90–100	0. 2–0. 8	0. 15–0. 20	6. 1–7. 3	Low	High.
CH or MH	A–7	100	100	90–100	<0. 2	0. 10–0. 15	6. 1–7. 3	Low	High.
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ML	A–4	95–100	90–100	80–95	0. 2–2. 5	0. 20–0. 25	4. 5–5. 5	Moderate	Low.
ML or CL	A–4 or A–7	95–100	90–100	80–95	0. 2–2. 5	0. 20–0. 25	4. 5–5. 5	Moderate	Moderate.
ML or CL	A–6	95–100	90–100	80–95	<0. 2	0. 15–0. 20	4. 5–5. 5	Moderate	Moderate.
ML or CL	A–4 or A–6	95–100	90–100	80–95	0. 2–2. 5	0. 20–0. 25	5. 1–5. 5	Moderate	Moderate.
MH or CH	A–7	95–100	90–100	85–95	0. 2–0. 8	0. 10–0. 15	5. 1–5. 5	Low	High.
MH or CH	A–7	95–100	90–100	85–95	0. 2–0. 8	0. 10–0. 15	5. 1–5. 5	Low	High.
ML	A–4	60 –80	55–75	50–65	0. 8–2. 5	0. 10–0. 20	4. 5–5. 0	Moderate	Low.
MH or CH	A–6 or A–7	75 –90	70–90	65–85	0. 8–2. 5	0. 10–0. 20	4. 5–5. 0	Low	High.
CH	A–7	70 –90	65–85	60–80	0. 2–0. 8	0. 05–0. 15	4. 5–5. 0	Low	High.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
TbF	Talbott cherty silt loam, 25 to 35 percent slopes.					
TcD3	Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded.	20+	5–15	Well-drained, cherty soils on uplands; clayey surface layer and subsoil; developed in material weathered from cherty limestone.	0–54	Cherty clay
TcE3	Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded.					
Vb	Vicksburg loam	0	30+	Well-drained soils on level bottoms; consist of recent alluvium from loess and coastal plain materials.	0–36	Loam
Vc	Vicksburg loam, local alluvium				36–60	Loam or fine sandy loam.
Wa	Waverly fine sandy loam	0	30+	Poorly drained soil on bottom lands; consists of 2 to 10 feet of young mixed alluvium washed from soils that formed from loess and coastal plain materials.	0–48	Fine sandy loam
Wb	Waverly silt loam	0	30+	Poorly drained soil on bottom lands; consists of 2 to 10 feet of young mixed alluvium washed from soils that formed from loess and coastal plain materials.	0–48	Silt loam with thin strata of sandy material.
WcB3	Waynesboro clay loam, 2 to 5 percent slopes, severely eroded.	20+	10–30+	Well-drained soils on high terraces; developed in old mixed alluvium.	0–60	Clay loam or sandy clay loam.
WcC3	Waynesboro clay loam, 5 to 8 percent slopes, severely eroded.					
WcD3	Waynesboro clay loam, 8 to 12 percent slopes, severely eroded.					
WcF3	Waynesboro clay loam, 12 to 35 percent slopes, severely eroded.					
WfB	Waynesboro fine sandy loam, 2 to 5 percent slopes.	20+	10–30+	Well-drained soils on high terraces; developed in old mixed alluvium.	0–9	Fine sandy loam
WfC	Waynesboro fine sandy loam, 5 to 8 percent slopes.				9–60	Clay loam or sandy clay loam.
WfD	Waynesboro fine sandy loam, 8 to 12 percent slopes.					
WfF	Waynesboro fine sandy loam, 12 to 35 percent slopes.					
WgD3	Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded.	20+	10–30+	Well-drained soils on high terraces; developed in old gravelly alluvium.	0–60	Gravelly clay loam or gravelly sandy clay loam.
WgE3	Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded.					
WmC	Waynesboro gravelly sandy loam, 5 to 8 percent slopes.	20+	10–30+	Well-drained soils on high terraces; developed in old gravelly alluvium.	0–10	Gravelly sandy loam.
WmD	Waynesboro gravelly sandy loam, 8 to 12 percent slopes.				10–60	Gravelly sandy clay loam.
WmE	Waynesboro gravelly sandy loam, 12 to 25 percent slopes.					
WnD	Waynesboro very gravelly sandy loam, 5 to 12 percent slopes.	20+	10–30+	Well-drained soils on high terraces; developed in old gravelly alluvium.	0–10	Very gravelly sandy loam.
WnE	Waynesboro very gravelly sandy loam, 12 to 25 percent slopes.				10–60	Very gravelly sandy loam or sandy clay loam.

See footnotes at end of table.

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
CH	A-7	70 -90	65-85	60-80	0. 2-0. 8	0. 05-0. 15	4. 5-5. 0	Low	High.
ML	A-4	100	90-100	55-75	0. 8-2. 5	0. 15-0. 25	5. 1-5. 5	Moderate	Low.
ML	A-4	100	90-100	50-75	0. 8-2. 5	0. 10-0. 20	5. 1-5. 5	Moderate	Low.
ML	A-4	100	90-100	50-75	0. 8-2. 5	0. 15-0. 20	5. 1-5. 5	High	Low.
ML	A-4	100	90-100	75-90	0. 2-0. 8	0. 20-0. 25	5. 1-5. 5	High	Low.
SM or ML	A-2, A-4, A-7.	85-100	80-100	25-95	0. 8-2. 5	0. 15-0. 20	4. 5-5. 5	Moderate	Moderate.
SM or ML	A-4	85-100	80-100	35-65	0. 8-2. 5	0. 15-0. 20	4. 5-5. 5	High	Low.
SM or ML	A-2, A-4, A-7.	88-100	85-100	25-95	0. 8-2. 5	0. 15-0. 20	4. 5-5. 5	Moderate	Moderate.
GC, GM, ML	A-2, A-6, A-7.	45-90	35-85	15-65	2. 5-5. 0	0. 05-0. 10	4. 5-5. 0	Moderate	Moderate.
SM or GM	A-4	60-80	50-75	35-50	2. 5-5. 0	0. 05-0. 10	4. 5-5. 0	High	Low.
GC, GM, ML	A-2, A-6, A-7.	45-90	35-85	15-65	2. 5-5. 0	0. 05-0. 10	4. 5-5. 0	Moderate	Moderate.
SM or GM	A-2 or A-4	35-70	25-65	15-40	5. 0-10. 0	0. 05-0. 10	4. 5-5. 0	High	Low.
SM or GM	A-2	35-65	25-60	15-35	5. 0-10. 0	0. 05-0. 10	4. 5-5. 0	Moderate	Low.

TABLE 6.—*Brief description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock [1]	Brief description of site and soil	Depth from surface (typical profile)	Classification
						USDA texture
		Feet	*Feet*		*Inches*	
WnF	Waynesboro very gravelly sandy loam, 25 to 45 percent slopes.					
WoA	Wolftever silt loam, 0 to 2 percent slopes.	0	30+	Moderately well drained soils on low terraces; developed in medium- to fine-textured alluvium.	0–8	Silt loam
WoB	Wolftever silt loam, 2 to 5 percent slopes.				8–50	Silty clay loam
WoB2	Wolftever silt loam, 2 to 5 percent slopes, eroded.					
WvB3	Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded.	0	30+	Moderately well drained soils on low terraces; developed in medium- to fine-textured alluvium.	0–50	Silty clay loam
WvC3	Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded.					

[1] The depth where 30+ is given may be much greater than 30 feet; it may be as much as 200 feet to bedrock.

[2] Variable

[3] Perched water table.

In the column that shows dispersion, the degree and rapidity with which the soil structure breaks down, or slakes, in water is given. Dispersion is expressed in terms of high, moderate, and low. High dispersion means that the soil slakes readily. In general, sandy soils would have high dispersion and clayey soils would have low dispersion.

The column that shows the shrink-swell potential gives the volume change of a soil when changes take place in its content of water. It is estimated primarily on the basis of the amount and type of clay. Shrink-swell potential is expressed as low, moderate, or high. In general, soils classed as CH or A–7 have high shrink-swell potential. Clean sands and gravel and soils having small amounts of nonplastic to slightly plastic materials have low shrink-swell potential.

Table 7 lists, for each mapping unit, specific features that adversely or favorably affect highway work or soil-and-water conservation work. These features are generally not apparent to the engineer unless he has access to the results of a field investigation. Nevertheless, they significantly influence construction practices.

The location of secondary roads in areas where the slopes are greater than 5 percent may be influenced by the depth to bedrock and the kind of bedrock. The engineer needs to know the type of rock to determine how difficult it will be to excavate. For all highways, the likelihood of slides in the dipping strata and of seepage of water along or through the bedrock should be determined. The presence of poor material within or slightly below the subgrade needs to be considered. A layer of highly plastic clay impedes internal drainage and provides a poor foundation. In some places, the clay layer should be cut out before the pavement is constructed. If this is not feasible, as, for example, in low, flat, or poorly drained areas, the roadway should be built well above the plastic clay layer or an embankment section should be used. Boulders, cobblestones, and stones are likely to cause grading problems.

The suitability of soils for winter grading depends largely on the texture of the soil material, its natural content of water, and depth to the water table in winter. Clay soils are difficult to handle when wet and must be dried to proper moisture for compaction. Therefore, these soils are rated "Poor."

Vertical alinement of roads is affected by poor drainage. An embankment section should be constructed to keep the roadway above high water in places where there is a seasonally high water table, as in many of the soils of Hardin County. Furthermore, most of the soils of the bottoms and low terraces are occasionally flooded. In such soils, an embankment section should be constructed to protect roadways. Interceptor ditches or underdrains may be needed where there is subsurface seepage, which is common at the base of slopes in deposits of local alluvium. The slumping or sliding of the overlying material may be a result of seepage in the back slopes of cuts. The depth to bedrock also affects vertical alinement.

In most of the county, earthwork is difficult during prolonged wet periods, but it is possible to excavate, haul, and compact the soil materials that are better drained and are coarse grained. The silty and clayey materials may absorb so much water during wet periods that they cannot be readily drained to the optimum moisture content, which is most favorable for proper compaction.

The suitability of the soil material for road subgrade and road fill depend mainly on the texture of the soil

their estimated physical properties—Continued

Classification—Continued		Percentage passing—			Selected characteristics significant in engineering				
Unified	AASHO	No. 4 sieve	No. 10 sieve	No. 200 sieve	Permeability	Available water capacity	Reaction	Dispersion	Shrink-swell potential
					Inches per hour	*Inches per inch*	*pH*		
ML	A-4	100	95–100	85–95	0. 2–2. 5	0. 20–0. 25	5. 1–6. 0	Moderate	Low.
ML or CH	A-6	100	95–100	85–95	0. 2–0. 8	0. 15–0. 25	5. 1–6. 0	Moderate	Moderate.
ML or CL	A-6	100	95–100	85–95	0. 2–0. 8	0. 15–0. 25	5. 1–6. 0	Moderate	Moderate.

material and its natural content of water. Highly plastic soil materials are rated "Poor" for road subgrade and "Poor" or "Fair" for road fill, depending on the natural content of water in the soil materials and the ease with which they can be handled, dried, and compacted.

A rating of the suitability of each soil as a source of subgrade and road fill material is also given in table 7. As a general rule, the most desirable materials are very coarse grained and are easily drained. Natural materials that are suitable for use in base courses and road fill are fairly scarce in this county. The most suitable deposits are in the Bodine, Bodine-Guin, Etowah, Saffell, and very gravelly Waynesboro soils and in Gravelly alluvial land.

Chert gravel can be used economically for secondary and county roads. It normally is not durable enough to be used in concrete structures or for base material for primary roads. Crushed limestone is more satisfactory. On a poor soil, a layer of chert can be used under suitable crushed limestone to decrease the amount of crushed limestone required.

Each soil is also rated as a source of topsoil and as a source of sand and gravel in table 7. In most soils the original surface layer is 7 inches or less in thickness, and in places this layer may even have been removed by sheet erosion. Consequently, the rating as a source of topsoil material refers to the material below the thin surface layer. For young soils like the Huntington, Ennis, Collins, and Vicksburg, and a few other soils that do not have distinct horizons, the rating applies to the entire soil profile.

The engineering problems of soil and water conservation are also evaluated in table 7. The construction of farm ponds is impeded by permeable substrata, cavernous bedrock, and inadequate or insufficient embankment material. A loss of stored water may result if there are permeable substrata near the surface. In areas where there are caverns in limestone bedrock, the water is likely to seep through the soil layer into the cavernous rock. The soils of Hardin County are rated according to the risk of failure of the reservoir. "Low" risk means that the chance of excess seepage into the reservoir area is small. "Shallowness over bedrock" means that a small amount of fill material is available. It may also mean, particularly in areas underlain by limestone, that the cavernous bedrock is close to the surface.

Engineering test data

To help evaluate the soils for engineering purposes, soil samples from the principal soil types of each of six extensive soil series were tested in accordance with standard procedures (*1*). The test data are given in table 8. The samples tested were generally obtained at a depth of less than 6 feet. Therefore, they are not representative of the soil material in deeper excavations.

The results of the tests and the classification of each sample according to both the AASHO and Unified systems are given in table 8. The data given in table 8 were obtained by mechanical analyses and by testing the soils to determine the liquid limits and plastic limits. Mechanical analyses were made by combining the sieve and hydrometer methods. The results of the mechanical analyses can be used to determine the relative proportions of the different size particles. Percentages of clay obtained by the hydrometer method should not be used as a basis for naming the textural classes of soils for agricultural purposes.

TABLE 7.—*Suitability and characteristics of the*

[Dashes indicate the soil generally has no

Soil series and map symbols	Suitability for winter grading	Suitability of soil material for—		Suitability as source of—		Features affecting suitability for—
		Road subgrade	Road fill	Topsoil	Sand and gravel	Vertical alinement for highways
Almo (Am)	Unsuitable	Poor	Poor	Poor	Unsuitable	Seasonal high water table; slow permeability.
Beason (Ba)	Unsuitable	Poor	Poor	Fair	Unsuitable	High water table; occasional flooding.
Bodine (BdD, BdF)	Good	Fair to good.	Fair	Poor	Unsuitable	Variable depth to bedrock
Bodine-Guin (BeF)	Good	Good	Good	Poor	Good	Variable depth to bedrock
Boswell (BfC, BfD, BoC3, BoD3, BpE2).	Poor	Poor	Poor	Fair	Unsuitable	----------
Brandon (BrC, BrD)	Good below a depth of 28 inches, but poor above.	Good below a depth of 28 inches.	Good below a depth of 28 inches.	Upper 2 feet is fair to good.	Good below a depth of 28 inches.	----------
Bruno (Bu)	Good	Good	Fair to poor.	Unsuitable	Good	Occasional flooding
Captina (CaA, CaB2, CbB3)	Unsuitable	Poor	Poor	Upper 2 feet is fair to good.	Unsuitable	Seasonal high water table
Colbert (CcD, CcE)	Unsuitable	Poor	Poor	Poor	Unsuitable	Slow permeability; shallowness to bedrock.
Colbert-Talbott very rocky soils (CdE, CeE).	Unsuitable	Poor	Poor	Poor	Unsuitable	Shallowness to bedrock
Collins (Cf, Cg, Ch)	Unsuitable	Poor	Poor	Good	Unsuitable	Seasonal high water table; flooding.
Culleoka (CkD, CkF)	Fair	Fair	Fair	Fair to good.	Unsuitable	Bedrock at a depth between 2 and 3 feet.
Cuthbert (CnE, CnF, CrF, CsD)	Poor	Poor	Poor	Poor	Unsuitable	Mostly clay and silt; slow permeability.
Dandridge-Needmore (DaD, DaF)	Good	Poor	Poor	Poor	Unsuitable	Shallowness to bedrock
Dexter (DcB3, DcC3 DcD3, DeB2, DeC2, DeD).	Fair	Good below a depth of about 3 feet.	Fair	Upper 3 feet is good.	Sandy material below a depth of 3 feet.	----------
Dulac (DkB, DkB2, DkB3, DkC, DkC3).	Unsuitable	Poor	Poor; easily eroded.	Upper 2 feet is fair.	Unsuitable	Seasonal high water table
Dunning (Du)	Unsuitable	Poor	Poor	Fair	Unsuitable	Seasonal high water table; occasional flooding.
Egam (Ea)	Unsuitable	Poor	Poor	Good	Unsuitable	Occasional flooding; slow permeability.

See footnotes at end of table.

soils that affect engineering construction

characteristics that interfere with the stated use]

Features affecting suitability for—Continued				
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions
Reservoir area	Embankment			
Low risk of seepage below a depth of 2 feet.	Low strength and stability.	Subsoil that is slowly permeable.	Shallow root zone; somewhat poor drainage.	Not applicable.
Slowly permeable soil with low risk of seepage.	Low strength and stability.	Slow permeability in the subsoil.	(1)	Not applicable.
Very porous; material favors excess seepage.	Adequate strength; moderately permeable.	(2)	Low water-holding capacity.	Very cherty and is shallow to bedrock in some places.
Very porous; material favors excess seepage.	Very permeable; easy to compact.	(2)	Very low water-holding capacity.	Very cherty and gravelly and is shallow to bedrock in some places.
Moderate risk of seepage; difficult to compact.	Fair to low strength and stability.	(2)	(1)	(3).
High risk of seepage; subsoil material is fairly easy to compact.	Fair strength and stability.	(2)	(1)	(3).
Very porous; material favors excess seepage.	Poorly graded fine sand that is permeable and erodes easily.	(2)	Low water-holding capacity.	Not applicable.
Low risk of seepage below a depth of 2 feet.	Fair to low strength and stability.	(2)	Fragipan at a depth of about 2 feet.	(3).
Moderate to high risk of seepage; bedrock may be cavernous.	Fair to low strength and stability.	(2)	Low water-holding capacity.	Shallowness to rock; clayey subsoil.
Many rock outcrops	Limited soil material	(2)	Shallow; many rock outcrops.	Rock outcrops.
Moderate risk of seepage; underlying materials are variable.	Fair to low strength and stability.	(2)	(1)	Not applicable.
Moderate to high risk of seepage.	Permeable; fair strength and stability.	(2)	(1)	Moderate depth to bedrock.
Moderate to low risk of seepage; some sand below a depth of 2 feet.	Poorly graded; fair strength and stability.	(2)	Clayey subsoil	Clayey subsoil.
Low risk of seepage; tight-bedded shale bedrock.	Limited soil material	(2)	Low water-holding capacity.	Shallowness to rock.
Underlying material is sandy and porous.	Poorly graded; fair strength and stability.	(2)	(1)	(3).
Low risk of seepage below a depth of 20 inches.	Low strength and stability.	(2)	Fragipan at a depth of 2 feet.	(3).
Clayey material; low risk of seepage.	Fair to low strength and stability.	Slow permeability in subsoil.	Slow permeability in subsoil.	Not applicable.
Low risk of seepage; subsoil is compacted.	Fair to low strength and stability.	(2)	Slow permeability in lower subsoil.	Not applicable.

637918—63——8

TABLE 7.—*Suitability and characteristics of the*

Soil series and map symbols	Suitability for winter grading	Suitability of soil material for—		Suitability as source of—		Features affecting suitability for—
		Road subgrade	Road fill	Topsoil	Sand and gravel	Vertical alinement for highways
Ennis (Ec, Ee, Ef, Em, En)	Poor	Fair to good.	Fair to good.	Good	Unsuitable	Occasional flooding
Etowah (EtC3, EtD3)	Poor	Fair to good.	Good	Fair	Poor	
Falaya (Fa, Fm)	Unsuitable	Poor	Poor	Fair to good.	Unsuitable	Seasonal high water table; flooding.
Freeland (FrB2, FrB3, FrC2, FrC3)	Poor	Poor	Poor	Upper 2 feet is fair to good.	Unsuitable	Seasonal high water table; slow permeability.
Gravelly alluvial land (Ga)	Good	Good	Good	Unsuitable	Good	Occasional flooding
Gullied land (Gc, Gm, Gs)	Unsuitable	Poor	Poor	Unsuitable	Unsuitable	Susceptible to slides
Hatchie (Ha)	Unsuitable	Poor	Poor	Poor	Unsuitable	Seasonal high water table; slow permeability.
Humphreys (HcB2, HmB2)	Poor	Fair	Fair	Good	Unsuitable	Occasional flooding
Huntington (Hn, Hu)	Poor	Poor	Fair to poor	Good	Poor	Occasional flooding
Landisburg (LaD2, LaE, LcD3)	Poor	Fair to good	Fair	Fair to good	Poor	Seasonal high water table
Lee (Le, Lm)	Poor	Fair to poor	Poor	Poor	Unsuitable	Flooding; high water table
Lindside (Ln, Ls)	Poor	Poor	Poor	Good	Unsuitable	Seasonal high water table; occasional flooding.
Lobelville (Lt, Lv)	Poor	Fair to poor	Fair to poor	Good	Unsuitable	Seasonal high water table; some flooding.
Magnolia (MaC, MaD, MaE)	Fair	Good	Good	Fair	Unsuitable	
Mantachie (Mc)	Unsuitable	Fair	Fair	Fair	Unsuitable	Seasonal high water table; flooding.
Melvin and Newark (Me)	Unsuitable	Poor	Poor	Fair	Unsuitable	High water table; flooding
Minvale (MhD, MhE, MnD3, MnE3)	Fair	Fair to good.	Fair to good.	Fair to good.	Poor	
Mountview (MoC)	Fair	Poor	Poor	Good	Unsuitable	
Paden (PaB, PaB2, PaB3, PaC, PaC2, PaC3, Pc).	Poor	Poor	Poor	Upper 2 feet is fair to good.	Unsuitable	Seasonal high water table; slow permeability.
Pickwick (PkB, PkB2, PkC, PkC2, PkD, PkE, PwB3, PwC3, PwD3, PwE3, Px).	Fair to poor.	Poor	Fair	Fair to good.	Unsuitable	

See footnotes at end of table.

soils that affect engineering construction—Continued

Features affecting suitability for—Continued				
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions
Reservoir area	Embankment			
Porous soil; high risk of seepage.	Fair to good strength and stability.	(2)	(1)	Not applicable.
High risk of seepage	Good strength and stability.	(2)	Many pebbles and cobblestones.	(3).
Moderate risk of seepage; underlying materials are variable.	Fair to low strength and stability.	Seasonal high water table; some flooding; permeable subsoil.	Somewhat poor drainage	Not applicable.
Material may be sandy below a depth of 3 feet; moderate risk of seepage.	Upper 3 feet has low strength and stability.	(2)	Fragipan at a depth of about 2 feet.	(3).
Very porous	High strength and stability.	(2)	Not suitable for crops	Not applicable.
High risk of seepage	Material is variable	(2)	Not suitable for crops	Rapid runoff; many gullies.
Underlying material may be sandy; moderate risk of seepage.	Fair to poor strength and stability to a depth of 3 feet, but below that depth the material is better.	Moderately slow permeability; seasonal high water table.	Somewhat poor drainage; shallow root zone.	Not applicable.
Moderate to high risk of seepage.	Fair to good strength and stability.	(2)	(1)	(3).
Moderate to high risk of seepage; underlying materials are variable.	Fair strength and stability.	(2)	(1)	Not applicable.
Moderate risk of seepage; easy to compact.	Good strength and stability.	(2)	Fragipan at a depth of 2 feet.	(3).
Low risk of seepage	Erodes easily; low strength and stability.	Seasonal high water table; some flooding; permeable subsoil.	Poor drainage; shallow root zone.	Not applicable.
Underlying material is variable.	Fair to good strength and stability.	Seasonal high water table; some flooding; permeable subsoil.	(1)	Not applicable.
Underlying material is variable; moderate risk of seepage.	Fair to good strength and stability.	Seasonal high water table; some flooding; permeable subsoil.	(1)	Not applicable.
Moderate risk of seepage; fairly easy to compact.	Good strength and stability.	(2)	(1)	(3).
Variable	Fair to good strength and stability.	Permeable subsoil	Somewhat poor drainage	Not applicable.
Low risk of seepage, but underlying material is variable.	Fair to poor strength and stability.	High water table and some flooding; permeable subsoil.	Poor drainage and shallow root zone.	Not applicable.
Porous soil; moderate to high risk of seepage.	Good strength and stability.	(2)	(1)	(3).
Underlying materials are variable.	Upper 2 feet has low strength and stability.	(2)	(1)	(3).
Moderate to low risk of seepage.	Fair to low strength and stability; erode easily.	(2)	Fragipan at a depth of about 2 feet.	(3).
Porous material; favors excess seepage.	Fair to good strength and stability.	(2)	(1)	(3).

TABLE 7.—*Suitability and characteristics of the*

Soil series and map symbols	Suitability for winter grading	Suitability of soil material for—		Suitability as source of—		Features affecting suitability for—
		Road subgrade	Road fill	Topsoil	Sand and gravel	Vertical alinement for highways
Robertsville (Rb)	Poor	Poor	Poor	Poor	Unsuitable	Occasionally ponded; slow permeability.
Rock land (Rc)	Fair	Poor	Poor	Poor	Unsuitable	Shallowness to bedrock
Ruston (RfC, RfD, RfE, RfF, RuD3, RuE3).	Good	Good	Good	Poor	Fair	
Saffell (SaD, SaE)	Good	Good	Good	Poor	Fair to good.	
Sequatchie (ScA, ScB2, SeC3)	Poor	Fair	Fair to poor.	Good	Poor	Occasional flooding
Shubuta (ShC3, ShD3, ShE3, SmC, SmC2, SmD, SmE, SmF, Sp).	Poor to fair.	Fair	Fair	Fair to poor.	Poor	
Silerton (SrB, SrB2, SrC, SrC2, SrD, SsB3, SsC3, SsD3).	Fair	Fair	Fair	Upper 2 feet is fair.	Poor	
Sumter (SuD2, SuF2)	Poor	Poor	Poor	Fair to poor.	Unsuitable	
Swamp (Sw)	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Under water most of the time.
Taft (Ta)	Unsuitable	Poor	Poor	Poor	Unsuitable	Seasonal high water table; slow permeability.
Talbott (TbD, TbE, TbF, TcD3, TcE3, TsB, TsC, TsD, TtC3, TtE3, TsE).	Poor	Poor	Poor	Poor	Unsuitable	Bedrock
Vicksburg (Vb, Vc)	Poor	Poor	Poor	Good	Unsuitable	Occasional flooding
Waverly (Wa, Wb)	Unsuitable	Poor	Poor	Fair	Unsuitable	High water table; occasional flooding.
Waynesboro (WcB3, WcC3, WcD3, WcF3, WfB, WfC, WfD, WfF).	Poor	Fair to good	Fair to good	Fair	Unsuitable	
Waynesboro, gravelly and very gravelly (WgD3, WgE3, WmC, WmD, WmE, WnD, WnE, WnF).	Fair to good	Good	Good	Poor	Poor to fair	
Wolftever (WoA, WoB, WoB2, WvB3, WvC3).	Poor	Poor	Poor	Fair to good	Unsuitable	Seasonal high water table; some flooding.

[1] Soil properties are favorable for irrigation.

[2] Good natural drainage.

soils that affect engineering construction—Continued

Features affecting suitability for—Continued				
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions
Reservoir area	Embankment			
Low risk of seepage; material is fine textured and compact.	Low strength and stability.	Slow permeability	Poor drainage; slow permeability.	Not applicable.
Cavernous bedrock	Little soil material	(2)	Not suited to crops	Many rock outcrops.
Very permeable and porous	Poorly graded sandy material.	(2).	Low water-holding capacity.	(3)
Very permeable and porous	Good strength and stability, but permeable.	(2)	Very low water-holding capacity.	In places there are beds of gravel below a depth of 2 feet.
Porous material; the underlying material is variable.	Fair to good strength and stability.	(2)	(1)	(3).
Sandy clay subsoil; moderate to low risk of seepage.	Good strength and stability.	(2)	(1)	(3).
Sandy clay material below a depth of about 3 feet.	Upper 3 feet has low strength and stability.	(2)	(1)	(3).
Clayey material; moderate risk of seepage.	Fair to low strength and stability.	(2)	Low water-holding capacity; moderate to low response.	Very clayey and difficult to work.
Partially under water		Depends on suitable outlets.	Not suitable for crops	Not applicable.
Slow permeability; low risk of seepage.	Low strength and stability; mostly fine material.	Slow permeability; seasonal high water table.	Somewhat poor drainage; slowly permeable subsoil.	Not applicable.
Clayey material; bedrock cavernous.	Adequate strength and stability.	(2)	Moderate to low response; shallow root zone.	Occasional rock outcrops.
Porous material	Low strength and stability.	(2)	(1)	Not applicable.
Variable	Low strength and stability.	Seasonal high water table.	Poor drainage	Not applicable.
Porous material; favors excess seepage.	Fair strength and stability.	(2)	(1)	(3).
Permeable and very porous	Good strength and stability.	(2)	Low water-holding capacity; low response.	In places there are beds of gravel below a depth of 2 feet.
Low risk of seepage; subsoil is compact.	Fair to low strength and stability.	(2)	Moderately slow permeability in the subsoil.	Not applicable.

[3] Soil properties are favorable for terraces and diversions.

TABLE 8.—*Engineering*

Name of soil and location	Parent material	Tennessee report No.	Depth	Horizon	Moisture-density [2]: Maximum dry density	Moisture-density [2]: Optimum moisture
Bodine cherty silt loam: [7]			*Inches*		*Lb. per cu. ft.*	*Percent*
0.2 mile SW. of Olivehill on a ridge. (Modal profile.)	Cherty limestone (Fort Payne formation).	51	2–10	A_2	91	20
		52	10–22	BC	100	14
10 miles NE. of Savannah. (No BC horizon.)	Cherty limestone (Fort Payne formation).	23	2–13	A_2	98	15
		21	13–25	B_2	105	12
		26	25–39	C	108	14
14 miles S. of Savannah on a ridge. (AC horizon.)	Cherty limestone (Fort Payne formation).	38	1–6	A_2	101	16
		36	6–26	C	107	15
Falaya silt loam:						
0.4 mile N. of Crump and 250 yards W. of State Highway 69. (Modal profile.)	Alluvium	45	0–8	A_p	101	15
		44	16–33	C_{g2}	102	15
11 miles SW. of Savannah. (Finer textured than the modal profile.)	Alluvium	34	0–9	A_p	103	15
		39	21–37	C_{g2}	112	11
14 miles SSW. of Savannah. (Coarser textured than the modal profile.)	Alluvium	40	0–8	A_{11}	102	16
		37	23–39	C_{g2}	111	14
Paden silt loam:						
2 miles NW. of Saltillo. (Modal profile.)	Alluvium	42	1–8	A_2	99	15
		43	11½–23	B_2	100	17
		41	23–33	B_{3m1}	107	14
		50	41–54+	B_{2b}	105	17
2.5 miles W. of Crump. (Sandier B_{2b} horizon than that of the modal profile.)	Alluvium	33	5–11	A_2	110	12
		35	15½–24	B_{21}	105	16
		32	37–52	B_{3m2}	115	10
		31	57–75	B_{2b}	116	11
0.6 mile SW. of Childers Hill. (Gravelly B_{3m} and B_{2b} horizons.)	Alluvium	12	½–7	A_2	104	14
		15	10–26	B_2	105	16
		14	26–39	B_{3m}	116	11
		18	39–50+	B_{2b}	94	23
Pickwick silt loam:						
10.1 miles S. of Savannah on State Highway 128. (Modal profile.)	Loess over old alluvium on high terraces.	53	2–8	A_2	109	12
		60	11½–25	B_2	105	13
		59	25–42	B_{2b}	108	17
5.3 miles ENE. of Cerro Gordo. (The loess is thicker than that of the modal profile.)	Loess over old alluvium on high terraces.	2	1–8	A_2	106	13
		4	14–36	B_2	108	17
		7	36–62	B_{2b}	103	19
10.5 miles SW. of Savannah. (The loess is thinner than that of the modal profile.)	Loess over old alluvium on high terraces.	1	1–6	A_2	109	11
		9	9–20	B_2	109	17
		3	20–50	B_{2b}	96	22
Shubuta fine sandy loam:						
7.5 miles NE. of Savannah. (Modal profile.)	Coastal plain materials	27	1–8	A_2	114	9
		30	11–23	B_{21}	98	20
		29	23–33	B_{22}	104	17
		28	33–54+	C	110	15
10.35 miles SE. of Savannah on Pinhook Road. (Finer textured in the B_{21} horizon and has more mica in the B_{22} and C horizons than the modal profile.)	Coastal plain materials	24	1–8	A_2	105	13
		25	11–27	B_{21}	101	20
		22	37–56+	C	103	18
2.6 miles NNW. of State Highway 69 on State Highway 104. (Grading toward Boswell series.)	Coastal plain materials	49	1–8	A_2	106	13
		48	11–35	B_2	95	23
		46	35–43	C_1	92	23
Waynesboro fine sandy loam:						
2.25 miles E. of Pickwick Village. (Modal profile.)	Alluvium on old high terraces	47	1–9	A_2	110	10
		54	24–43	B_{22}	101	18
		55	43–85+	C	107	16

See footnotes at end of table.

test data [1]

Mechanical analyses [3]													Liquid limit	Plasticity index	Classification	
Percentage passing sieve [4]									Percentage smaller than— [4]						AASHO [5]	Unified [6]
2-in.	1½-in.	1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	92	82	79	73	69	66	64	62	60	46	17	9	34	(8)	A-4(5)	ML.
100	93	80	68	46	33	27	24	23	22	18	5	4	21	(8)	A-1-b(0)	GM.
100	92	78	72	54	45	40	38	37	34	25	8	5	26	(8)	A-4(0)	GM.
100	86	69	61	41	31	22	20	19	18	15	4	3	23	(8)	A-1-b(0)	GM.
100	92	76	66	42	28	22	18	17	16	12	5	3	22	(8)	A-1-b(0)	GM.
-----	100	98	96	86	69	53	42	38	36	26	10	5	28	(8)	A-4(1)	GM.
100	98	92	87	68	47	31	27	26	22	16	8	6	27	5	A-2-4(0)	GM-GC.
-----	-----	-----	-----	-----	-----	100	99	95	93	76	28	19	30	6	A-4(8)	ML-CL.
-----	-----	-----	-----	-----	-----	100	99	84	82	63	26	18	28	6	A-4(8)	ML-CL.
-----	-----	-----	-----	-----	-----	-----	100	91	88	69	33	25	34	9	A-4(8)	ML-CL.
-----	-----	-----	-----	-----	-----	100	99	85	79	66	32	23	32	10	A-4(8)	ML-CL.
-----	-----	-----	-----	-----	-----	100	100	91	86	66	27	18	35	8	A-4(8)	ML.
-----	-----	-----	-----	-----	100	100	99	44	41	33	18	13	21	(8)	A-4(2)	SM.
-----	-----	-----	-----	-----	-----	100	94	85	82	53	16	9	25	(8)	A-4(8)	ML.
-----	-----	-----	-----	-----	-----	100	96	90	87	70	33	28	38	11	A-6(8)	ML.
-----	-----	-----	100	99	98	97	88	76	72	54	24	20	32	11	A-6(8)	CL.
-----	-----	-----	100	96	92	88	78	61	59	51	34	29	40	18	A-6(8)	CL.
-----	-----	-----	-----	-----	-----	100	94	79	75	49	14	9	21	(8)	A-4(8)	ML.
-----	-----	-----	-----	-----	-----	100	96	86	82	65	36	30	40	12	A-6(9)	ML.
-----	-----	-----	-----	-----	-----	100	93	74	70	51	23	18	28	7	A-4(8)	ML-CL.
-----	-----	-----	-----	100	99	99	76	39	37	31	25	24	34	16	A-6(2)	SC.
-----	-----	-----	-----	-----	-----	100	98	88	85	75	44	18	22	(8)	A-4(8)	ML.
-----	-----	-----	-----	-----	-----	100	99	89	85	65	32	27	36	11	A-6(8)	ML-CL.
100	97	92	86	77	67	63	61	46	41	31	15	12	29	10	A-4(2)	GC.
100	98	97	94	88	85	82	79	60	58	52	44	41	49	16	A-7-5(9)	ML.
-----	-----	-----	-----	100	99	99	95	75	71	48	17	11	20	(8)	A-4(8)	ML.
-----	-----	-----	-----	100	99	98	95	79	75	62	33	27	34	10	A-4(8)	ML-CL.
-----	-----	-----	100	99	97	95	89	63	59	50	33	30	33	9	A-4(6)	ML-CL.
-----	-----	-----	-----	-----	-----	100	98	89	83	56	28	20	32	11	A-6(8)	CL.
-----	-----	-----	-----	-----	-----	100	98	88	84	63	38	33	40	12	A-6(9)	ML.
-----	-----	-----	-----	100	99	98	95	76	71	58	40	34	39	15	A-6(10)	ML-CL.
-----	-----	-----	100	99	99	98	89	68	63	36	13	9	18	(8)	A-4(7)	ML.
-----	-----	-----	100	99	99	95	89	75	71	53	32	28	38	14	A-6(10)	ML-CL.
-----	100	96	90	77	69	65	54	46	41	37	29	27	45	18	A-7-6(5)	GM-GC.
-----	100	99	99	98	96	94	94	88	78	21	9	6	15	(8)	A-4(8)	ML.
-----	-----	-----	-----	100	99	99	98	59	57	55	46	43	45	16	A-7-6(8)	ML.
-----	-----	-----	-----	100	99	99	98	50	47	44	38	34	39	11	A-6(3)	SM.
-----	-----	-----	-----	100	100	99	98	48	45	38	28	24	32	(8)	A-4(3)	SM.
-----	-----	-----	-----	-----	100	100	98	66	59	40	17	13	23	(8)	A-4(6)	ML.
-----	-----	-----	-----	-----	100	100	99	66	61	56	47	40	48	14	A-7-5(9)	ML.
-----	-----	-----	-----	-----	-----	100	100	65	53	40	33	26	39	(8)	A-4(6)	ML.
-----	-----	-----	100	99	97	96	84	61	60	36	14	9	21	(8)	A-4(5)	ML.
-----	-----	-----	-----	-----	100	98	94	77	70	55	45	42	51	14	A-7-5(12)	MH.
-----	-----	-----	-----	-----	100	97	93	84	75	53	45	41	57	17	A-7-5(14)	MH.
-----	-----	-----	-----	-----	-----	100	98	61	57	39	14	10	17	(8)	A-4(5)	ML.
-----	-----	-----	-----	-----	-----	100	100	96	75	47	43	41	40	(8)	A-4(8)	ML.
-----	-----	-----	-----	-----	-----	100	99	46	42	38	33	31	34	(8)	A-4(2)	SM.

TABLE 8.—*Engineering*

Name of soil and location	Parent material	Tennessee report No.	Depth	Horizon	Moisture-density [2]	
					Maximum dry density	Optimum moisture
			Inches		*Lb. per cu. ft.*	*Percent*
10.5 miles SE. of Savannah. (Sandier B horizon than that of the modal profile.)	Alluvium on old high terraces	17	2–9	A_2	122	9
		16	13–25	B_{21}	118	11
		20	25–37	B_{22}	110	13
		19	37–55+	C	112	13
10 miles SW. of Savannah. (No C horizon.)	Alluvium over coastal plain materials.	6	1–9	A_2	119	10
		8	12½–32	B_2	99	21
		10	32–63	B_3	107	18
Waynesboro gravelly sandy loam:						
10.1 miles S. of Savannah on State Highway 128. (Modal profile.)	Alluvium on old high terraces	58	2–9	A_2	114	9
		57	12–22	B_2	107	16
		56	22–36	B_3	107	16
10.5 miles SW. of Savannah. (Clayey B_2 horizon.)	Alluvium on old high terraces	11	2–12	A_2	115	9
		5	16–39	B_2	98	22
		13	39–55	B_3	105	17

[1] Tests performed by Tennessee Department of Highways and Public Works in accordance with standard procedures of the American Association of State Highway Officials (AASHO).

[2] Based on the Moisture-Density Relations of Soils Using a 5.5-lb. Rammer and a 12-inch Drop, AASHO Designation T 99-57, Method A.

[3] Mechanical analyses according to the American Association of State Highway Officials Designation: T 88-54. Results by this procedure frequently differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses

Formation, Morphology, and Classification of Soils[5]

In this section are discussed the factors that affect soil formation, the morphology and composition of the soils of Hardin County, and the classification of the soils in higher categories.

Factors of Soil Formation

Soil is a function of parent material, climate, living organisms, relief, and time. The nature of the soil at any point on the earth depends upon the combination of the five major factors at that point. All five of these factors come into play in the formation of every soil. The relative importance of each differs from place to place. In extreme cases, one factor may dominate in the formation of the soil and fix most of its properties, but for every soil the past combination of the five major factors is of the first importance to its present character.

In the following pages the five major factors of soil formation are discussed in relation to their effects on the soils of Hardin County.

[5] This section was prepared by E. C. SEASE, soil scientist, Soil Conservation Service.

Parent material

In Hardin County, parent material is the most important cause of differences among soils. Several different kinds of parent material are identified in the county. They consist of material weathered from cherty limestone and argillaceous (clayey) limestone; calcareous silty and sandy shale; coastal plain gravel, sand, sandy clay, and clay; loess; and alluvium.

Climate

Hardin County has the humid, temperate type of climate that is characteristic of the southeastern United States. The summers are hot and the winters are mild. Rainfall is abundant and averages about 54 inches a year. Annual snowfall is light. A more complete discussion of the climate in the county is given in the section "General Nature of the Area."

The climate is uniform throughout the county. Consequently, although the climate has strongly influenced many soils of the county, the local differences among soils cannot be attributed to differences in climate.

Living organisms

The native vegetation in the county, like the climate, was fairly uniform and is relatively unimportant in accounting for local differences among the soils. However,

test data—Continued

Mechanical analyses [3]																
Percentage passing sieve [4]									Percentage smaller than—[4]				Liquid limit	Plasticity index	Classification	
2-in.	1½-in.	1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			AASHO [5]	Unified [6]
------	100	99	99	94	87	82	68	34	34	25	10	6	16	(8)	A–2–4(0)	SM.
------	------	------	100	98	94	88	74	38	38	31	21	18	28	7	A–4(1)	SM–SC.
------	------	------	------	------	100	99	88	32	32	31	28	26	37	3	A–2–4(0)	SM.
------	------	------	------	100	99	98	88	25	25	23	23	23	26	(8)	A–2–4(0)	SM.
------	100	99	97	92	87	83	77	38	32	18	7	3	(8)	(8)	A–4(1)	SM.
------	------	------	100	99	99	98	91	54	54	52	49	47	48	14	A–7–5(6)	ML.
100	99	98	97	94	93	92	79	40	40	39	37	36	46	11	A–7–5(2)	SM.
100	99	96	93	83	75	72	65	44	40	29	12	7	21	(8)	A–4(2)	SM.
100	99	97	87	66	56	52	44	28	27	24	19	16	39	16	A–2–6(1)	GC.
------	100	98	89	74	50	36	21	14	14	12	12	11	48	14	A–2–7(0)	GM.
------	100	96	92	75	61	56	48	39	35	25	8	6	19	(8)	A–4(1)	GM.
------	100	98	96	91	87	84	79	64	60	48	39	34	43	15	A–7–6(8)	ML–CL.
------	100	97	90	65	46	37	29	23	21	19	16	15	51	19	A–2–7(1)	GM.

used in this table are not suitable for use in naming textural classes for soils.

[4] Based on total material. Laboratory test data corrected for amount discarded in field sampling.

[5] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes. AASHO Designation: M 145–49.

[6] Based on the Unified Soil Classification System, Technical Memorandum No. 3–357, v. 1, Waterways Experiment Station, Corps of Engineers, March 1953.

[7] In the field sampling for Bodine cherty silt loam, it was estimated that, in the A_2 horizon of the modal profile, 50 percent of the material larger than 3 inches in diameter was discarded; in the second profile, 10 percent of such material in the A_2 horizon, 12 percent in the B_2 horizon, and 30 percent in the C horizon was discarded.

[8] Nonplastic.

the vegetation has had a strong influence on the characteristics the soils possess in common.

In general, the soils of the county have formed under a deciduous forest. On the well-drained soils, the dominant trees were oaks, hickories, and poplars. On the upper part of west-facing and south-facing slopes of some of the hills, a few pines were intermingled with the hardwoods. Originally, there were a few chestnut trees, but they were killed by the blight. On the poorly drained areas, the trees were dominantly water-tolerant oaks, sycamores, willows, beeches, gums, and maples. Many cypresses grew in the swampy areas on the bottom lands. The main differences in the native vegetation seem to have been associated with variations in drainage.

Little is known of the micro-organisms, earthworms, and other forms of life that live on and in the soils of the county, though they undoubtedly had a strong influence upon the formation of the soils. The greatest activity of earthworms and other small animals is in the uppermost few inches of the soil.

The complex of living organisms in the county has been changed drastically by man's activity. The clearing of the forests, the cultivating of the fields, the introducing of new species of plants, and drainage of wet areas will affect the direction and the rate of soil formation in the future.

Relief

The soils of Hardin County range from nearly level to steep. The maximum difference in elevation between the valleys and the crests of adjacent hills is about 200 feet.

Relief affects the formation of soils by its control of natural drainage, runoff, and erosion. On steep slopes, a large amount of water runs off the surface. As a result, the soil materials are constantly being removed by erosion and do not remain in place long enough to form definite horizons. Examples are the soils of the Bodine and Cuthbert series. On uplands where slopes are gentle, the soils generally have thick profiles that are well expressed. In level areas or depressions where the water table is high, the soils are likely to be gray and wet.

Time

Differences in length of time account for most of the soil differences not attributed to the other factors of soil formation. The soils of Hardin County range from very old to very young. In general, the older soils have a greater degree of horizon differentiation than the young soils.

Most soils that formed on the smoother parts of the uplands and on older stream terraces have a well-defined soil profile. These soils are old, or mature. They formed in materials that are less resistant to weathering or that have

been in place long enough for distinct horizons to have developed.

The soil materials on first bottoms and in local alluvial areas have little or no horizon development. They are young, or immature, soils. Their horizons are few or weakly expressed because time has been too short, or because the actions of climate or the other factors of soil formation have not been sufficient to cause greater development.

Morphology of the Soils

Soil morphology in Hardin County is expressed by strongly developed horizons in most of the soils. A few soils have weakly developed horizons. It might be said that most of the soils are in equilibrium with the soil-forming factors, or that they are mature soils. The B horizon of most of the soils has moderate subangular blocky structure and is high in clay.

The differentiation of horizons in soils of the county is the result of one or more of the following processes. (1) Accumulation of organic matter, (2) leaching of carbonates and salts, (3) translocation of silicate clay minerals, and (4) reduction and transfer of iron. In most soil profiles in the county, two or more of these processes have operated in the development of horizons.

Some organic matter has accumulated in the uppermost layer of all but a few soils in Hardin County to form an A_1 horizon. Much of this organic matter is in the form of humus. The quantities are very small, and over a large part of the county the A_1 horizon has been obliterated by cultivation. The accumulation of organic matter has been important among the processes of horizon differentiation in most of the soils in the county.

Leaching of carbonates and salts has occurred in all soils of the county, but it has been of limited importance in horizon differentiation. The effects have been indirect; leaching has permitted the subsequent translocation of silicate clay minerals in some soils. Carbonates and salts have been carried completely out of the profiles of most of the soils. Most of the soils are strongly acid or very strongly acid.

Translocation of silicate clay minerals has contributed to the development of almost all of the soils except those consisting of recent alluvium. It is one of the more important processes in horizon differentiation in the older soils in the county. The A horizon of many of the soils shows strong eluviation, and the B horizon is high in clay. Clay films on the surfaces of peds and in former root channels are evidence of much movement of silicate clays from the A horizon into the B horizon.

The reduction and transfer of iron, a process often called gleying, has occurred in the poorly drained and somewhat poorly drained soils. It has occurred to some extent in the deeper horizons of the moderately well drained soils, for example, the Paden soils. In the naturally wet soils this process has been of importance in horizon differentiation. Iron has been segregated in certain horizons of some of the soils to form yellowish-red, strong-brown, or yellowish-brown mottles. It has also been segregated in concretions in some soils.

In table 9 laboratory data for some of the important soils in Hardin County are presented.

Classification of the Soils

Soils are classified in various categories to show their relationship to one another. The lower units of classification—the series and types—are explained in the section, "How Soils are Named, Mapped, and Classified."

Soil series are classified into the next higher category, the great soil group. Each great soil group is made up of soils that have the same general kind of profile but that differ in kinds of parent material, in relief, or in degree of development. The broadest categories of soil classification are the three soil orders—zonal, intrazonal, and azonal (*10*).

Zonal soils have well-developed characteristics that reflect the influence of the active factors of climate and living organisms in their formation. In Hardin County the zonal soil order is made up of Red-Yellow Podzolic soils and of Gray-Brown Podzolic soils. All of these soils are well drained. They are on uplands and terraces in gently sloping to steep areas where the parent material has been in place a long time.

Intrazonal soils have well-developed characteristics that reflect the dominant influence of some local factor of relief or parent material rather than of climate and living organisms. In this county soils of the Planosol, Rendzina, Low-Humic Gley, and Humic Gley great soil groups are in the intrazonal order. Intrazonal soils commonly are associated with soils of the zonal group.

Azonal soils lack well-defined characteristics because of youth, resistant parent material, or relief. In Hardin County the azonal soils are represented by the Alluvial soils, Lithosols, and Regosols. The parent material of these soils has been in place only a short time.

Table 10 classifies the soil series of Hardin County by soil orders and great soil groups. It also gives distinguishing characteristics of each series and some of the factors that influence the formation of the soils.

Red-Yellow Podzolic soils

The Red-Yellow Podzolic great soil group belongs to the zonal order. The group is made up of well-drained, acid soils that have a well-developed profile. These soils have thin, organic (A_0) and organic-mineral (A_1) horizons that overlie a light-colored, bleached (A_2) horizon. The A_2 horizon rests on a more clayey, red, yellowish-red, or yellow B horizon. The parent materials are all more or less siliceous. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray are characteristic of deep horizons of Red-Yellow Podzolic soils that are underlain by a thick layer of parent material (*8*).

In general, the soils of this group have a low cation-exchange capacity of 6 to 12 milliequivalents per 100 grams of soil, and a base saturation status of about 20 to 50 percent. Kaolinite is the dominant clay mineral. The subsoil has moderate to strong, medium, subangular blocky structure and moderate to high chroma. The soils in this great soil group are listed in table 10.

Captina, Dulac, Freeland, Landisburg, and Paden soils are classified as Red-Yellow Podzolic soils, but, unlike the other soils in this great soil group, they have a weak to moderate fragipan, or a compacted, mottled layer, at a depth of about 2 feet. Sequatchie soils are

Red-Yellow Podzolic soils that intergrade toward Alluvial soils. Etowah soils are also Red-Yellow Podzolic soils, but they intergrade toward Reddish-Brown Lateritic soils.

Gray-Brown Podzolic soils

Gray-Brown Podzolic soils belong to the zonal order. These soils have a fairly thin organic covering (A_0) and an organic-mineral layer (A_1) that overlies a grayish-brown, leached A_2 horizon. The A_2 horizon rests upon an illuvial, brown B horizon. These soils formed under deciduous trees in a temperate, moist climate.

The Culleoka soils are the only ones in Hardin County classified as representative Gray-Brown Podzolic soils. These soils have a dark-brown A horizon and a strong-brown B horizon. They are only moderately leached and moderately developed.

Planosols

Planosols belong to the intrazonal order. These soils have one or more horizons abruptly separated from and sharply contrasting to an adjacent horizon because of cementation, compaction, or high content of clay. These soils formed in nearly level areas under grass or trees in a humid climate.

The Almo, Hatchie, Robertsville, and Taft soils are classified as Planosols in Hardin County. The fragipan in these soils is predominantly silt and is below the B_2 horizon. These soils are somewhat poorly drained to poorly drained.

Rendzinas

The Rendzinas belong to the intrazonal order. These soils generally have a dark-gray or black, friable surface horizon that is underlain by light-gray or yellowish material that is calcareous.

The only Rendzina soils mapped in Hardin County are those of the Sumter series. The surface layer of these soils is a fairly thin, very dark gray silty clay that is granular. It overlies light olive-brown, calcareous clay.

Low-Humic Gley soils

Low-Humic Gley soils are an intrazonal group of soils that are somewhat poorly drained to poorly drained. These soils have thin surface horizons that are moderately high in organic matter. These horizons overlie mottled gray and brown, gleylike mineral horizons that have a low degree of textural differentiation.

The Beason, Lee, Melvin, and Waverly soils are Low-Humic Gley soils. These soils occupy nearly level to depressional areas on first bottoms. The surface layer is dark grayish-brown silt loam that is 5 to 7 inches thick. It is underlain by gray silt loam to silty clay loam that is mottled with yellowish brown. The Beason soils are somewhat poorly drained, but the other soils are poorly drained. These soils are likely to be waterlogged during wet periods.

Humic Gley soils

The Humic Gley great soil group is an intrazonal group of soils. These soils are poorly drained to very poorly drained hydromorphic soils. The soils have moderately thick, dark-colored mineral horizons that are underlain by mineral-gley horizons. The soils formed under marsh, or a vegetation consisting of swamp and forest, in humid and subhumid climates.

The only soil in Hardin County classified as Humic Gley is that of the Dunning series. This soil has a fairly thick A horizon that is underlain by a dark-gray, gleyed horizon.

Alluvial soils

Alluvial soils belong to the azonal order. These soils are forming in transported and relatively recently deposited materials, or alluvium. They are characterized by weak modification of the original material by soil-forming processes.

In Hardin County, the development of horizons in Alluvial soils ranges from none, in areas where the deposits are recent, to weak, where the deposits are older. The color of the soils ranges from very dark grayish brown to brown.

The Bruno, Collins, Egam, Ennis, Huntington, Lindside, Lobelville, and Vicksburg soils are representative of the Alluvial soils. The Falaya, Mantachie, and Newark are also Alluvial soils, but they have some characteristics of Low-Humic Gley soils. These last-named soils are somewhat poorly drained, are mottled at a depth below 12 to 16 inches, and are grayish in the lower part of the subsoil.

Lithosols

Lithosols are azonal soils that have little or no profile development. They consist mainly of partly weathered fragments of rock or of nearly barren rock. They generally are rolling to steep. These soils consist of materials that are easily eroded and that occupy positions where geologic erosion is relatively rapid. As a result, the soil-forming processes have not acted on the parent material long enough to have developed well-defined genetic soil properties.

The Dandridge soils are the only Lithosols mapped in Hardin County. They have developed in material weathered from calcareous shale. In most places they lack a B horizon and are shallow to bedrock.

Regosols

Regosols are azonal soils in which few or no clearly expressed soil characteristics have developed. They have formed in deep, unconsolidated mineral deposits.

In Hardin County the soils of the Bodine and Guin series are members of the Regosol great soil group. The Bodine soils developed in material weathered from very cherty limestone. They are underlain by beds of chert at depths between 1 and 3 feet. The Guin soils developed in beds of Tuscaloosa gravel. From 50 to 90 percent of the soil mass below a depth of 8 to 10 inches is gravel. Geologic erosion has fairly well kept pace with the soil forming processes, and the soils show very little profile development. The soils of both series, however, have a very thin A_1 horizon and some evidence of an A_2 horizon. In places the Bodine soils have indications of a thin B horizon.

TABLE 9.—*Chemical and physical characteristics*

[Samples for Falaya, Freeland, and Silerton soils were from Henderson County, and determinations were by Soil Survey Laboratory, by Soil Survey Laboratory,

Soil type and sample location	Horizon	Depth	Chemical characteristics						
			Exchangeable cations (milliequivalents per 100 grams)					Total cation exchange capacity (NH_4 OAc)	Base saturation (NH_4 OAc)
			Calcium	Magnesium	Potassium	Sodium	Hydrogen		
		Inches							*Percent*
Beason silt loam: Site 1	A_p	0–10	9. 9	1. 1	0. 2	<0. 1	10. 3	15. 4	73
	B_{1g}	10–19	5. 6	1. 2	0. 2	0. 1	16. 3	16. 1	44
	B_{2g}	19–26	5. 0	1. 7	0. 2	0. 1	17. 8	17. 4	40
	B_{3mg1}	26–39	4. 3	1. 8	0. 2	0. 1	15. 5	16. 7	38
	B_{3mg2}	39–48	4. 0	1. 7	0. 2	0. 2	16. 2	15. 9	38
	B_{3mg3}	48–60	4. 2	1. 7	0. 2	0. 2	15. 8	16. 5	38
	C_1	60–71+	3. 6	1. 6	0. 2	0. 2	13. 5	13. 8	40
Beason silt loam: Site 2	A_p	0–7	9. 3	1. 0	0. 2	<0. 1	9. 6	14. 0	75
	B_{1g}	7–18	4. 7	1. 1	0. 2	<0. 1	16. 7	17. 2	35
	B_{2g}	18–28	6. 3	1. 7	0. 2	0. 1	15. 2	18. 8	44
	B_{3mg1}	28–37	5. 1	1. 6	0. 2	0. 1	16. 5	19. 7	36
	B_{3mg2}	37–46	3. 0	1. 5	0. 2	0. 1	17. 4	18. 5	26
	B_{3mg3}	46–63	1. 8	1. 4	0. 2	0. 1	18. 2	16. 0	22
	C	63–86	2. 3	2. 3	0. 2	0. 3	13. 1	14. 4	35
Egam silty clay loam: Site 1	A_{p1}	0–5	14. 1	1. 5	0. 2	0. 1	9. 8	21. 6	74
	A_{p2}	5–8	9. 6	1. 3	0. 2	0. 1	19. 7	22. 6	50
	A_{1b}	8–13	13. 8	1. 4	0. 2	0. 1	17. 8	23. 8	65
	CB_1	13–22	9. 2	1. 3	0. 2	0. 1	21. 8	22. 6	48
	CB_2	22–33	11. 5	1. 5	0. 2	0. 1	18. 2	22. 7	58
	CB_3	33–49	11. 4	1. 3	0. 2	0. 1	13. 8	19. 1	68
	Du_1	49–58	9. 0	1. 0	0. 2	0. 1	11. 5	15. 4	67
	Du_2	58–75	7. 0	1. 0	0. 1	0. 1	10. 8	13. 5	61
	Du_3	75–91	6. 1	0. 8	0. 1	<0. 1	8. 1	10. 9	64
Egam silty clay loam: Site 2	A_p	0–7	13. 6	1. 8	0. 2	<0. 1	10. 4	18. 9	82
	A_{1b1}	7–15	18. 5	1. 6	0. 2	<0. 1	15. 1	24. 7	74
	A_{1b2}	15–22	15. 6	1. 6	0. 2	<0. 1	12. 9	22. 8	76
	CB_1	22–31	14. 3	1. 3	0. 2	<0. 1	11. 1	20. 9	76
	CB_2	31–42	15. 0	1. 4	0. 2	0. 1	12. 6	22. 4	74
	CB_3	42–51	14. 5	1. 5	0. 2	0. 1	12. 6	21. 1	77
	CB_4	51–70	14. 3	1. 4	0. 2	0. 1	12. 6	21. 6	74
	CB_5	70–86	15. 1	1. 4	0. 2	0. 1	12. 2	21. 2	79
	C_1	86–96	14. 2	1. 2	0. 2	0. 1	10. 9	20. 2	78
Falaya silt loam: Site 1	A	0–12	5. 7	1. 5	0. 3	0. 1	6. 5	10. 5	72
	C_{g1}	12–24	5. 1	1. 2	0. 1	0. 2	4. 9	8. 4	78
	C_{g2}	24–36	4. 5	1. 3	0. 1	0. 5	4. 5	7. 8	82
	C_{g3}	36–48	4. 2	1. 2	0. 1	0. 5	3. 2	6. 8	88
	C_{g4}	48–60	4. 3	1. 4	0. 1	0. 4	3. 2	7. 4	84
Falaya silt loam: Site 2	A_p	0–9	3. 4	0. 6	0. 2	0. 1	8. 2	8. 8	49
	C_{g1}	9–20	2. 2	0. 7	0. 2	0. 1	11. 0	9. 1	35
	C_{g2}	20–30	1. 8	0. 8	0. 2	0. 2	13. 3	11. 1	27
	C_{g3}	30–42	1. 5	0. 6	0. 2	0. 1	11. 0	9. 8	24
	C_{g4}	42+	1. 7	0. 7	0. 2	0. 2	11. 9	10. 2	27

See footnotes at end of table.

of some representative soils

SCS, Beltsville, Md.; samples for Beason, Egam, Paden, Pickwick, and Wolftever soils were from Hardin County, and determinations were SCS, Lincoln, Nebr.]

Chemical characteristics—Continued		Physical characteristics							Textural class
		Size class and diameter of particles in millimeters							
pH (1:1)	Organic carbon	Very coarse sand (2.0–1.0)	Coarse sand (1.0–0.5)	Medium sand (0.5–0.25)	Fine sand (0.25–0.1)	Very fine sand (0.1–0.05)	Silt (0.05–0.002)	Clay (<0.002)	
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	
5.9	1.43	[2] 0.4	[2] 1.1	[2] 0.8	[2] 1.4	[3] 2.7	67.8	25.8	Silt loam.
5.0	0.40	[2] 0.7	[2] 2.7	[2] 1.9	[2] 2.6	[3] 3.2	55.3	33.6	Silty clay loam.
5.0	0.39	[2] 0.2	[2] 1.5	[2] 1.3	[2] 2.7	[3] 7.7	50.5	36.1	Silty clay loam.
4.9	0.32	[2] 0.2	[2] 0.7	[2] 0.7	[2] 2.6	[3] 13.0	47.9	34.9	Silty clay loam.
4.9	0.27	[2] 0.1	[2] 0.6	[2] 0.8	[2] 2.4	[3] 4.3	55.7	36.1	Silty clay loam.
4.9	0.28	<0.1	<0.1	[2] 0.1	[4] 1.2	3.8	54.2	40.7	Silty clay.
4.9	0.20	<0.1	0.1	0.6	5.3	8.0	50.2	35.8	Silty clay loam.
5.7	1.18	[2] 0.2	[2] 0.4	[2] 0.3	[2] 0.7	[3] 1.8	70.2	26.4	Silt loam.
4.9	0.40	[2] 0.7	[2] 1.8	[2] 1.0	[2] 1.8	[4] 3.3	56.1	35.3	Silty clay loam.
5.0	0.44	[2] 1.1	[2] 1.6	[2] 0.9	[2] 1.9	[4] 3.5	52.3	38.7	Silty clay loam.
5.0	0.24	[2] 1.0	[2] 1.9	[2] 1.0	[2] 1.9	[4] 3.4	49.9	40.9	Silty clay.
4.9	0.17	[2] 1.7	[2] 2.1	[2] 1.0	[4] 2.0	[4] 3.8	48.6	40.8	Silty clay.
4.9	0.13	[2] 0.4	[2] 1.2	[2] 1.0	[4] 2.4	[3] 5.6	52.0	37.4	Silty clay.
4.9	0.13	<0.1	[3, 5] 0.2	[3, 5] 0.3	4.7	16.0	48.0	30.8	Clay loam.
5.7	1.36	<0.1	[2] 0.3	[2] 0.2	[2] 0.9	[2] 1.5	58.2	38.9	Silty clay loam.
5.1	1.03	<0.1	[2] 0.2	[2] 0.2	[2] 1.0	[2] 1.9	52.8	43.9	Silty clay.
5.3	1.16	0.6	1.3	[3] 0.7	[3] 1.0	[2] 1.6	51.5	43.3	Silty clay.
4.9	0.98	<0.1	[2] 0.1	[2] 0.1	[2] 1.3	[2] 1.8	50.1	46.6	Silty clay.
5.1	1.03	<0.1	[2] 0.2	[2] 0.3	[3] 6.4	[3] 3.1	46.6	43.4	Silty clay.
5.2	0.60	<0.1	<0.1	[3] 0.1	[3] 1.1	[3] 5.0	52.4	41.4	Silty clay.
5.3	0.38	<0.1	<0.1	[6] 0.1	5.7	18.6	44.7	30.9	Clay loam.
5.2	0.30	<0.1	<0.1	[6] 0.3	13.4	25.8	34.5	26.0	Loam.
5.4	0.20	<0.1	[6] 0.1	[6] 0.5	31.6	22.4	23.7	21.7	Sandy clay loam.
5.9	1.57	<0.1	<0.1	[4] 0.1	[4] 0.5	[3] 2.2	64.6	32.6	Silty clay loam.
5.5	1.43	<0.1	<0.1	<0.1	[2] 0.7	[4] 3.5	54.8	41.0	Silty clay.
5.7	1.08	<0.1	<0.1	[2] 0.1	[2] 0.8	[3] 5.9	55.0	38.2	Silty clay loam.
5.6	0.79	<0.1	<0.1	[2] 0.1	[3] 0.8	9.1	53.9	36.1	Silty clay loam.
5.5	0.76	<0.1	<0.1	<0.1	[3] 0.4	4.9	55.1	39.6	Silty clay loam and silty clay.
5.4	0.69	<0.1	<0.1	<0.1	[3] 0.4	3.4	55.3	40.9	Silty clay.
5.4	0.65	<0.1	<0.1	<0.1	[3] 0.3	3.2	55.2	41.3	Silty clay.
5.4	0.60	<0.1	<0.1	[3] 0.1	[3] 0.4	2.4	55.0	42.1	Silty clay.
5.5	0.44	<0.1	[5] 0.1	[5] 0.1	0.3	4.2	56.8	38.5	Silty clay loam.
5.4	0.96	0.1	0.2	[4] 0.2	[4] 1.7	[4] 12.5	67.4	17.9	Silt loam.
5.4	0.29	<0.1	0.3	[4] 0.4	[4] 2.1	[4] 17.1	65.5	14.6	Silt loam.
5.2	0.23	<0.1	0.3	[4] 0.4	[4] 1.5	[4] 18.4	66.7	12.7	Silt loam.
5.5	0.21	0.1	0.4	[4] 0.3	[4] 2.1	[4] 25.2	60.7	11.2	Silt loam.
5.8	0.21	0.1	0.4	[4] 0.3	[4] 3.3	[4] 23.4	63.1	9.4	Silt loam.
4.9	0.99	[4] 0.2	[4] 0.9	[4] 1.5	[4] 7.0	[4] 18.0	59.0	13.4	Silt loam.
4.7	0.31	<0.1	[4] 0.8	[4] 1.7	[4] 8.0	[4] 18.9	52.5	18.1	Silt loam.
4.8	0.17	[4] 0.1	[4] 0.6	[4] 1.3	[4] 6.8	[4] 17.0	52.0	22.2	Silt loam.
4.7	0.17	[4] 0.1	[4] 0.7	[4] 1.5	[4] 8.1	[4] 19.7	51.1	18.8	Silt loam.
4.9	0.11	[4] 0.1	[4] 0.7	[4] 1.2	[4] 7.3	[4] 20.2	51.5	19.0	Silt loam.

TABLE 9.—*Chemical and physical characteristics*

Soil type and sample location	Horizon	Depth	Chemical characteristics: Exchangeable cations (milliequivalents per 100 grams): Calcium	Magnesium	Potassium	Sodium	Hydrogen	Total cation exchange capacity (NH_4 OAc)	Base saturation (NH_4 OAc)
		Inches							*Percent*
Freeland silt loam: Site 1	A_p	0–8	1. 9	0. 6	0. 2	<0. 1	4. 5	4. 6	59
	B_{21}	8–13	6. 5	1. 6	0. 2	0. 1	5. 5	10. 0	84
	B_{22}	13–18	7. 8	2. 4	0. 2	0. 2	6. 4	12. 5	85
	B_{3m1}	18–25	6. 6	2. 8	0. 2	0. 3	6. 9	12. 2	81
	B_{3m2}	25–34	3. 4	2. 9	0. 2	0. 3	8. 7	10. 6	64
	C_1	34–46	1. 3	2. 3	0. 2	0. 3	8. 2	8. 6	48
	C_2	46–58	1. 6	3. 3	0. 1	0. 5	6. 4	9. 0	61
Freeland silt loam: Site 2	A_p	0–4	2. 5	0. 8	0. 6	<0. 1	3. 6	6. 4	61
	B_{21}	4–13	2. 3	1. 9	0. 4	0. 1	8. 6	10. 0	47
	B_{22}	13–16	1. 5	2. 8	0. 3	0. 2	10. 7	11. 4	42
	B_{23}	16–24	1. 1	2. 6	0. 3	0. 2	10. 2	11. 0	38
	B_{3m1}	24–29	0. 4	1. 9	0. 2	0. 1	7. 8	8. 0	32
	B_{3m2}	29–35	0. 1	1. 4	0. 2	0. 2	7. 4	8. 1	23
	B_{3m3}	35–43	<0. 1	2. 5	0. 2	0. 2	8. 6	9. 1	32
	C_{11}	43–52	<0. 1	1. 8	0. 2	0. 3	6. 9	8. 8	26
	C_{12}	52–58	0. 9	3. 0	0. 2	0. 4	8. 6	11. 3	40
	D	58+	1. 1	2. 8	0. 1	0. 3	5. 7	8. 2	52
Paden silt loam: Site 1	A_1	0–2	1. 6	0. 9	0. 3	<0. 1	11. 6	8. 8	32
	A_2	2–9	0. 1	0. 3	0. 2	<0. 1	7. 3	4. 6	13
	B_{21}	9–18	<0. 1	1. 7	0. 2	<0. 1	11. 7	10. 5	18
	B_{22}	18–23	<0. 1	1. 7	0. 1	0. 1	10. 7	9. 7	20
	B_{23g}	23–26	0. 1	1. 3	0. 1	0. 1	9. 7	9. 5	17
	B_{2bg1}	26–42	0. 1	1. 5	0. 1	0. 1	11. 2	9. 9	18
	B_{2bg2}	42–52	0. 1	3. 0	0. 1	0. 4	16. 4	16. 1	22
	B_{2bg3}	52–71	0. 1	3. 8	0. 1	0. 6	15. 7	17. 2	27
	B_{2bg4}	71–87	0. 3	3. 3	0. 1	0. 7	13. 2	14. 9	30
	B_{2bg4}	87–111	0. 7	2. 5	0. 1	0. 9	10. 5	12. 0	35
Paden silt loam: Site 2	A_1	0–1	---	---	---	---	---	---	---
	A_2	1–8	<0. 1	0. 4	0. 1	<0. 1	12. 8	3. 6	14
	B_{21}	8–16	0. 1	2. 1	0. 2	<0. 1	13. 7	9. 7	25
	B_{22}	16–23	0. 5	2. 3	0. 2	<0. 1	11. 0	11. 2	27
	B_{3g}	23–28	0. 7	2. 6	0. 3	0. 1	11. 3	11. 7	32
	B_{2bg1}	28–34	0. 3	1. 7	0. 2	0. 1	9. 0	8. 7	26
	B_{2bg2}	34–46	0. 1	2. 5	0. 1	0. 2	9. 7	9. 8	30
	B_{2bg3}	46–67	0. 5	3. 1	0. 1	0. 4	10. 7	11. 3	36
	B_{2bg4}	67–91+	1. 6	4. 3	0. 1	0. 7	12. 2	12. 7	53
Pickwick silt loam: Site 1	A_p	0–5	6. 0	0. 8	0. 2	<0. 1	3. 9	7. 7	91
	B_1	5–10	6. 9	0. 9	0. 2	<0. 1	5. 1	9. 5	84
	B_{21}	10–17	4. 0	3. 5	0. 3	0. 1	6. 8	11. 8	67
	B_{22}	17–27	1. 0	3. 3	0. 3	<0. 1	9. 5	11. 3	41
	B_{2b1}	27–39	0. 3	2. 2	0. 2	0. 1	9. 3	9. 5	29
	B_{2b2}	39–54	0. 2	2. 3	0. 2	0. 1	10. 7	10. 4	27
	B_{2b3}	54–75	0. 2	2. 3	0. 2	0. 1	11. 2	11. 8	24
	B_{2b4}	75–101	0. 9	2. 4	0. 2	0. 1	10. 2	10. 9	33
	B_{2b4}	101–124	1. 9	2. 3	0. 2	0. 1	10. 0	10. 6	42
Pickwick silt loam: Site 2	A_p	0–6	11. 1	0. 4	0. 7	<0. 1	1. 7	8. 4	145
	B_{21}	6–14	7. 7	1. 4	0. 3	<0. 1	4. 2	10. 8	87
	B_{22}	14–20	1. 9	2. 5	0. 3	<0. 1	9. 6	9. 8	48
	B_{23}	20–32	0. 3	1. 8	0. 2	<0. 1	8. 8	8. 7	26
	B_{2b1}	32–41	0. 1	2. 4	0. 2	<0. 1	10. 0	10. 4	26
	B_{2b2}	41–52	0. 3	2. 8	0. 2	<0. 1	9. 8	9. 5	33
	B_{2b3}	52–65	0. 1	2. 4	0. 2	<0. 1	10. 0	10. 1	27

See footnotes at end of table.

of some representative soils—Continued

Chemical characteristics—Continued		Physical characteristics							
		Size class and diameter of particles in millimeters							
pH (1:1)	Organic carbon	Very coarse sand (2.0–1.0)	Coarse sand (1.0–0.5)	Medium sand (0.5–0.25)	Fine sand (0.25–0.1)	Very fine sand (0.1–0.05)	Silt (0.05–0.002)	Clay (<0.002)	Textural class [1]
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	
5.4	0.37	[4] 0.1	[4] 1.1	[4] 2.5	[4] 9.8	[4] 3.5	74.4	8.6	Silt loam.
5.7	0.29	[4] 0.1	[4] 0.4	[4] 0.8	[4] 2.8	[4] 1.1	71.7	23.1	Silt loam.
5.7	0.25	<0.1	[4] 0.3	[4] 0.7	[4] 2.6	[4] 1.3	68.7	26.4	Silt loam.
5.5	0.17	<0.1	[4] 0.4	[4] 1.1	[4] 4.2	[4] 2.0	67.4	24.9	Silt loam.
5.0	0.09	<0.1	[4] 0.5	[4] 1.5	[4] 6.4	[4] 2.9	65.9	22.8	Silt loam.
5.2	0.07	[4] 0.1	[4] 0.9	[4] 2.5	[4] 10.6	[4] 4.3	61.6	22.0	Silt loam.
5.4	0.05	[4] 0.1	[4] 0.8	[4] 2.6	[4] 11.9	[4] 4.4	58.4	21.8	Silt loam.
5.7	0.98	[4] 0.2	[4] 0.9	[4] 0.8	[4] 1.7	[4] 2.2	82.6	11.6	Silt.
4.7	0.32	[4] 0.1	[4] 0.7	[4] 0.7	[4] 1.1	[4] 1.2	69.7	26.5	Silt loam.
4.7	0.21	[4] 0.1	[4] 0.8	[4] 0.8	[4] 1.5	[4] 1.6	68.1	27.1	Silty clay loam.
4.8	0.17	[4] 0.1	[4] 0.9	[4] 1.0	[4] 1.9	[4] 2.3	68.4	25.4	Silt loam.
4.8	0.08	[4] 0.5	[4] 1.8	[4] 2.0	[4] 3.8	[4] 4.8	67.9	19.2	Silt loam.
4.9	0.07	[4] 0.5	[4] 1.8	[4] 2.2	[4] 4.6	[4] 5.5	65.3	20.1	Silt loam.
4.9	0.07	[4] 0.6	[4] 2.1	[4] 2.3	[4] 3.9	[4] 6.8	63.0	21.3	Silt loam.
4.7	0.07	[4] 0.6	[4] 2.2	[4] 2.7	[4] 5.5	[4] 6.7	61.5	20.8	Silt loam.
4.8	0.06	[4] 0.4	[4] 2.4	[4] 3.1	[4] 6.1	[4] 7.3	51.6	29.1	Silty clay loam.
5.1	0.04	[4] 0.9	[4] 5.2	[4] 6.5	[4] 11.2	[4] 14.4	39.8	22.0	Loam.
4.8	3.38	[7] 0.2	[7] 1.0	[4] 0.7	3.8	3.2	82.9	8.2	Silt.
4.7	0.90	[2] 0.3	[2] 0.6	[2] 0.6	[4] 3.2	2.9	82.8	9.6	Silt.
4.9	0.28	[2] 0.1	[2] 0.4	[2] 0.4	[7] 2.6	2.6	68.6	25.3	Silt loam.
4.9	0.16	[2] 0.2	[4] 0.6	[3] 0.5	3.6	3.7	68.3	23.1	Silt loam.
5.0	0.09	[2] 0.4	[4] 0.4	[3] 0.5	4.4	4.6	69.5	20.2	Silt loam.
5.2	0.06	[2] 0.2	[4] 0.2	[3] 0.4	4.1	4.8	65.6	24.7	Silt loam.
4.9	0.07	<0.1	0.1	0.4	5.0	4.9	47.3	42.3	Silty clay.
4.7	0.09	0.1	0.1	0.5	5.8	5.0	38.5	50.0	Clay.
4.6	0.08	<0.1	0.1	0.5	6.6	5.5	42.5	44.8	Silty clay.
4.6	0.09	<0.1	0.2	0.7	9.3	8.0	44.4	37.4	Silty clay loam.
4.3	---	---	---	---	---	---	---	---	
4.7	0.69	[2] 0.4	[4] 1.2	[3] 1.6	5.0	4.5	77.7	9.6	Silt loam.
4.9	0.42	[2] 0.2	[4] 0.6	[3] 1.0	3.0	2.8	66.8	25.6	Silt loam.
5.1	0.22	<0.1	[4] 0.6	[3] 1.0	3.1	2.9	65.3	27.1	Silty clay loam and silt loam.
5.1	0.20	[2] 0.1	[4] 0.7	[3] 1.2	3.6	3.8	65.0	25.6	Silt loam.
5.3	0.06	[2] 0.2	[4] 0.9	[3] 1.9	6.7	6.8	61.9	21.6	Silt loam.
5.2	0.06	[2] 0.2	[4] 1.0	[3] 2.2	7.5	8.0	65.9	25.2	Silt loam.
5.0	0.06	[2] 0.3	[3] 1.1	2.9	10.0	10.9	44.4	30.4	Clay loam.
5.0	0.08	[2] 0.2	[3] 1.0	[3] 1.8	11.6	13.4	30.4	41.6	Clay.
6.3	0.83	[7] 0.1	[8] 0.4	[9] 0.5	[9] 2.6	[9] 2.3	77.3	16.8	Silt loam.
6.6	0.39	<0.1	[8] 0.1	[9] 0.3	[9] 1.1	[9] 1.2	70.6	26.7	Silt loam and silty clay loam.
5.5	0.24	<0.1	[2] 0.2	[3] 0.2	1.2	1.0	66.6	30.8	Silty clay loam.
5.0	0.14	[2] 0.1	[2] 0.3	[2] 0.3	[3] 1.6	[3] 1.5	66.7	29.5	Silty clay loam.
4.9	0.08	[2] 0.6	[2] 0.7	0.4	2.5	2.1	66.3	27.4	Silty clay loam and silt loam.
4.8	0.07	[2] 0.3	[2] 0.4	0.5	3.2	2.7	55.0	37.9	Silty clay loam.
4.9	0.09	[2] 0.1	[2] 0.3	0.5	4.1	3.5	53.0	38.5	Silty clay loam.
4.8	0.07	[2] 0.2	[3] 0.2	0.6	5.0	4.4	46.0	43.6	Silty clay.
4.7	0.08	[2] 0.2	[3] 0.3	0.7	5.5	5.1	45.5	42.7	Silty clay.
7.5	0.85	[3] 0.4	[7] 0.9	[9] 1.3	[9] 4.2	[9] 2.0	73.2	18.0	Silt loam.
6.9	0.22	<0.1	[2] 0.3	0.6	1.9	1.1	65.9	30.2	Silty clay loam.
4.9	0.16	[2] 0.1	[2] 0.6	[3] 0.9	2.5	1.2	65.7	29.0	Silty clay loam.
4.9	0.08	[2] 0.7	[2] 1.0	[3] 1.4	4.3	2.0	63.8	26.8	Silt loam and silty clay loam.
4.9	0.08	[2] 0.6	[3] 0.9	1.6	4.5	2.1	55.8	34.5	Silty clay loam.
4.9	0.08	[2] 0.2	[3] 0.9	1.6	4.9	2.0	54.6	35.8	Silty clay loam.
4.9	0.09	0.6	1.0	1.9	5.8	2.5	52.1	36.1	Silty clay loam.

TABLE 9.—*Chemical and physical characteristics*

Soil type and sample location	Horizon	Depth	Chemical characteristics: Exchangeable cations (milliequivalents per 100 grams): Calcium	Magnesium	Potassium	Sodium	Hydrogen	Total cation exchange capacity (NH_4 OAc)	Base saturation (NH_4 OAc)
		Inches							*Percent*
Silerton silt loam: Site 1	A_p	0–4	2.9	<0.1	0.3	<0.1	1.6	4.4	73
	A_3	4–7	2.6	0.2	0.2	<0.1	2.8	4.9	61
	B_{21}	7–10	2.7	1.1	0.3	<0.1	5.7	8.3	49
	B_{22}	10–16	1.9	2.5	0.4	0.1	9.8	10.8	45
	C_1	16–22	0.8	2.6	0.3	0.1	9.8	10.4	36
	D_{1m}	22–27	0.1	2.4	0.2	0.1	6.9	8.2	34
	D_{2m}	27–32	0.1	2.4	0.2	0.1	6.5	7.7	36
	D_{3m1}	32–38	0.1	2.9	0.2	0.1	6.9	8.2	40
	D_{3m2}	38–45	0.1	2.9	0.1	0.1	7.8	8.6	37
	D_{4m}	45–52	0.1	1.6	0.1	0.1	6.9	8.6	23
Silerton silt loam: Site 2	A_p	0–4	3.5	1.7	0.4	0.1	6.1	8.1	70
	B_{21}	4–8	4.6	3.3	0.3	0.3	8.6	13.4	63
	B_{22}	8–12	2.5	2.4	0.3	0.2	10.7	13.0	42
	B_3	12–16	1.5	2.6	0.2	0.2	10.7	12.5	36
	B_{3m}	16–20	1.3	3.5	0.2	0.2	11.9	12.7	41
	D_{1cn}	20–29	1.5	5.7	0.3	0.3	14.0	17.5	44
	D_{u2}	29–34	2.1	8.1	0.2	0.3	14.5	20.5	52
	D_{u3}	34–48	2.4	9.1	0.2	0.4	14.1	20.6	59
	D_{u4}	48–60	3.2	10.7	0.3	0.4	12.9	21.1	69
	D_{u5}	60–70	4.4	13.8	0.5	0.5	10.8	23.8	81
Wolftever silt loam: Site 1	A_p	0–7	12.7	1.2	0.2	<0.1	8.8	19.2	73
	B_1	7–15	4.3	0.6	0.1	<0.1	15.0	16.4	30
	B_{21}	15–22	2.4	0.8	0.2	<0.1	17.5	17.0	20
	B_{2g2}	22–31	0.9	0.4	0.2	<0.1	17.7	14.4	10
	B_{2g3}	31–42	0.5	0.8	0.2	<0.1	15.7	13.7	11
	B_{2g4}	42–53	0.4	0.8	0.2	<0.1	15.4	13.3	10
	C_g	53–65	0.4	1.2	0.2	<0.1	15.2	14.3	12
Wolftever silt loam: Site 2	A_p	0–6	8.0	0.8	0.2	<0.1	12.0	14.7	61
	B_1	6–12	3.6	0.5	0.2	<0.1	14.5	13.2	32
	B_{21}	12–21	2.0	0.3	0.2	<0.1	15.0	13.4	19
	B_{22}	21–27	1.9	0.4	0.2	<0.1	14.2	11.8	21
	B_{2g3}	27–44	0.8	0.7	0.2	0.1	13.7	11.1	16
	B_{3g}	44–55	0.8	1.0	0.2	<0.1	14.2	11.9	17
	C_1	55–81	1.4	2.0	0.2	<0.1	14.0	12.7	28

[1] Determined by mechanical analysis.
[2] Many aggregates contain iron and mananese.
[3] A few aggregates contain iron and manganese.
[4] Aggregates commonly contain iron and manganese.
[5] Trace of mica fragments.
[6] Common mica fragments.

of some representative soils—Continued

Chemical characteristics—Continued		Physical characteristics							Textural class [1]
		Size class and diameter of particles in millimeters							
pH (1:1)	Organic carbon	Very coarse sand (2.0–1.0)	Coarse sand (1.0–0.5)	Medium sand (0.5–0.25)	Fine sand (0.25–0.1)	Very fine sand (0.1–0.05)	Silt (0.05–0.002)	Clay (<0.002)	
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	
6.2	1.00	0.4	[3] 0.7	[3] 0.8	[3] 7.6	[3] 15.5	67.6	7.4	Silt loam.
5.7	0.59	0.1	[3] 0.4	[3] 0.5	[3] 4.8	[3] 11.2	70.0	13.0	Silt loam.
5.0	0.49	0.1	[3] 0.2	[3] 0.3	[3] 3.6	[3] 8.9	63.9	23.0	Silt loam.
4.8	0.40	<0.1	[3] 0.2	[3] 0.3	[3] 3.5	[3] 9.6	56.8	29.6	Silty clay loam.
4.7	0.21	<0.1	[2] 0.2	[3] 0.4	[3] 5.7	[3] 13.5	53.6	26.6	Silt loam.
4.9	0.11	[2] 0.2	[2] 0.4	[3] 0.5	[3] 7.5	[3] 18.0	51.7	21.7	Silt loam.
5.0	0.07	[2] 0.2	[2] 0.4	[3] 0.6	[3] 9.0	[3] 24.6	50.6	14.6	Silt loam.
4.9	0.06	[2] 0.5	[2] 0.5	[3] 0.7	[3] 9.6	[3] 27.8	38.0	22.9	Loam.
4.8	0.05	[2] 0.4	[2] 0.5	[3] 0.5	[3] 8.4	[3] 35.0	23.8	31.4	Sandy clay loam.
4.5	0.07	[2] 0.5	[2] 0.6	[3] 0.5	[3] 10.3	[3] 40.8	16.9	30.4	Sandy clay loam.
5.5	0.72	[2] 0.5	[3] 0.6	[3] 0.4	[3] 1.1	[3] 2.7	76.3	18.4	Silt loam.
5.1	0.37	[2] 0.1	[2] 0.4	[3] 0.3	[3] 0.5	[3] 1.3	66.0	31.4	Silty clay loam.
4.8	0.24	[2] 0.6	[2] 0.6	[3] 0.3	[3] 0.6	[3] 1.6	66.3	30.0	Silty clay loam.
4.9	0.10	[2] 0.5	[2] 0.8	[3] 0.4	[3] 1.0	[3] 2.7	66.8	27.8	Silty clay loam.
5.0	0.08	[2] 1.4	[2] 1.0	[3] 0.4	[3] 1.0	[3] 3.2	63.6	29.4	Silty clay loam.
4.7	0.09	[2] 5.8	[2] 1.6	[3] 0.4	[3] 0.7	[3] 2.3	43.0	46.2	Silty clay.
4.4	0.09	[2] 4.8	[2] 2.0	[4] 0.5	[4] 0.6	[4] 1.1	29.8	61.2	Clay.
4.4	0.13	[2] 2.1	[2] 1.7	[4] 0.4	[4] 0.6	[4] 1.2	30.1	63.9	Clay.
4.2	0.14	[2] 1.6	[2] 1.2	[4] 0.4	[4] 0.6	[4] 1.0	31.6	63.6	Clay.
4.1	0.14	[2] 0.4	[2] 0.3	[3,5] 0.2	[3,5] 3.2	[3,5] 6.7	30.9	58.3	Clay.
6.4	1.46	[2] 0.2	[2] 0.4	[2] 0.4	[2] 0.7	[2] 0.9	64.2	33.2	Silty clay loam.
5.1	0.45	[2] 0.5	[2] 1.2	[2] 0.9	[2] 1.4	[4] 2.0	52.7	41.3	Silty clay.
5.0	0.17	[2] 0.1	[2] 0.4	[2] 0.6	[3] 1.7	[3] 3.2	47.6	46.4	Silty clay.
4.9	0.12	0.1	0.2	0.4	1.9	4.2	51.3	41.9	Silty clay.
4.9	0.12	0.1	0.1	0.4	2.7	4.6	54.1	38 0	Silty clay loam.
4.8	0.11	0.2	0.3	1.0	8.0	8.3	50.7	31.5	Silty clay loam.
4.8	0.09	0.1	0.2	1.0	8.3	9.8	50.9	29.7	Silty clay loam.
5.6	1.49	[2] 0.6	[2] 1.4	[2] 0.8	[4] 1.5	[3] 3.1	63.3	29.3	Silty clay loam.
5.0	0.44	[2] 0.8	[2] 1.6	[2] 0.9	[4] 2.3	[3] 5.1	50.7	38.6	Silty clay loam.
4.9	0.20	[2] 0.1	[2] 0.5	[2] 0.5	[3] 3.3	[3] 8.6	46.2	40.8	Silty clay.
4.9	0.15	<0.1	[2] 0.2	[2] 0.3	[3] 3.9	[3] 11.8	46.9	36.9	Silty clay loam.
4.8	0.09	<0.1	[3] 0.1	[7] 0.2	[3] 2.3	11.5	54.4	31.5	Silty clay loam.
4.8	0.10	<0.1	<0.1	[5] 0.2	[5] 1.4	6.0	59.3	33.1	Silty clay loam.
4.9	0.12	<0.1	[5] 0.1	[5] 0.4	[5] 4.0	6.5	55.9	33.1	Silty clay loam.

[7] Many aggregates contain iron and manganese; common fragments of organic matter.

[8] A few aggregates contain iron and manganese; trace of carbonates ($CaCO_3$).

[9] Trace of carbonates ($CaCO_3$).

TABLE 10.—*Classification of soil series by higher categories and some factors that have influenced soil formation*

ZONAL

Great soil group and series	Color and texture of profile	Drainage class	Parent material	Predominant slope range	Degree of development
Red-Yellow Podzolic soils:				*Percent*	
Boswell	Yellowish-brown fine sandy loam over yellowish-red or red clay.	Well drained	Acid coastal plain clay and sandy clay.	2 to 12	Strong.
Brandon	Brown silt loam over reddish-brown or yellowish-red silty clay loam.	Well drained	Loess over beds of coastal plain gravel.	5 to 12	Strong.
Captina [1]	Brown or dark grayish-brown silt loam over yellowish-brown silty clay loam; a fragipan at a depth of 24 inches.	Moderately well drained.	Alluvium, chiefly from limestone.	2 to 8	Strong.
Colbert	Light olive-brown silty clay loam over light olive-brown clay.	Moderately well drained.	Material weathered from shale or argillaceous limestone.	5 to 25	Medium.
Cuthbert	Light yellowish-brown fine sandy loam over yellowish-red sandy clay.	Moderately well drained.	Stratified, or thin-bedded, coastal plain, acid, gray clay and sandy clay.	5 to 35	Weak.
Dexter	Brown loam over reddish-brown or yellowish-red clay loam that becomes redder and more sandy with increasing depth.	Well drained	Old, mixed alluvium from loess and coastal plain material.	2 to 12	Strong.
Dulac [1]	Light yellowish-brown silt loam over yellowish-brown or strong-brown silty clay loam; a fragipan at a depth of 24 inches.	Moderately well drained.	Thin mantle of loess over acid coastal plain sandy clay.	2 to 8	Strong.
Etowah [2]	Brown gravelly silt loam over yellowish-red gravelly silty clay loam.	Well drained	General alluvium from sandstone, shale, and limestone.	5 to 12	Strong.
Freeland [1]	Brown loam over yellowish-brown silty clay loam or clay loam; a fragipan at a depth of about 24 inches.	Moderately well drained.	Old mixed alluvium from loess and coastal plain material.	2 to 8	Strong.
Humphreys	Brown silt loam over yellowish-brown silty clay loam.	Well drained	Alluvium, chiefly from cherty limestone.	2 to 5	Medium.
Landisburg [1]	Grayish-brown or pale-brown cherty silt loam over yellowish-brown or strong-brown cherty silty clay loam; a fragipan at a depth between 20 and 28 inches.	Moderately well drained.	Local alluvium, chiefly from cherty limestone.	5 to 20	Strong.
Magnolia	Yellowish-brown fine sandy loam over red to dark-red sandy clay or sandy clay loam.	Well drained	Coastal plain sandy clay, sandy clay loam, and clay.	5 to 25	Strong.
Minvale	Brown cherty silt loam over yellowish-red cherty silty clay loam.	Well drained	Local alluvium from cherty limestone.	5 to 15	Medium.
Mountview	Light yellowish-brown silt loam over strong-brown silty clay loam.	Well drained	Thin mantle of loess over material weathered from cherty limestone.	5 to 8	Strong.
Needmore	Brown silt loam over yellowish-brown or strong-brown to yellowish-red silty clay loam and silty clay.	Well drained	Calcareous shale and shaly limestone.	8 to 35	Strong.
Paden [1]	Yellowish-brown silt loam over yellowish-brown silty clay loam; a fragipan at a depth of 24 inches.	Moderately well drained.	Thin mantle of loess over old general alluvium.	2 to 8	Strong.

See footnotes at end of table.

TABLE 10.—*Classification of soil series by higher categories and some factors that have influenced soil formation*—Con.

ZONAL—Continued

Great soil group and series	Color and texture of profile	Drainage class	Parent material	Predominant slope range	Degree of development
Red-Yellow Podzolic soils—Continued				*Percent*	
Pickwick	Dark yellowish-brown to brown silt loam over yellowish-red to reddish-brown silty clay loam.	Well drained	Loess over old general alluvium.	2 to 25	Strong.
Ruston	Pale-brown fine sandy loam over yellowish-red to red sandy clay loam.	Well drained	Coastal plain, acid sandy clay loam.	5 to 45	Strong.
Saffell	Yellowish-brown gravelly sandy loam over yellowish-red gravelly clay loam.	Well drained to somewhat excessively drained.	Gravelly coastal plain material.	5 to 20	Strong.
Sequatchie [3]	Dark-brown fine sandy loam over yellowish-brown to strong-brown clay loam.	Well drained	General alluvium from sandstone, shale, and limestone.	2 to 5	Medium to weak.
Shubuta	Yellowish-brown fine sandy loam over yellowish-red or red sandy clay.	Well drained	Stratified beds of coastal plain sand and clay.	5 to 45	Strong.
Silerton	Light yellowish-brown silt loam over strong-brown silty clay loam; the material is red and yellowish-red at a depth below 24 inches.	Well drained to moderately well drained.	Thin mantle of loess over sandy clay, coastal plain material.	2 to 12	Strong.
Susquehanna	Dark-gray fine sandy loam over mottled gray, red, and reddish-brown clay.	Moderately well drained.	Acid coastal plain clay	5 to 35	Medium.
Talbott	Brown silt loam over yellowish-red silty clay or clay.	Well drained	Argillaceous limestone	5 to 25	Strong.
Waynesboro	Yellowish-brown fine sandy loam over yellowish-red or red clay loam.	Well drained	General alluvium from sandstone, shale, and limestone.	3 to 25	Strong.
Wolftever	Dark grayish-brown silt loam over yellowish-brown silty clay loam that is compact.	Well drained to moderately well drained.	General alluvium from limestone.	2 to 10	Medium.
Gray-Brown Podzolic soils:					
Culleoka	Brown silt loam over strong-brown silty clay loam.	Well drained	Calcareous sandstone and sandy shale.	5 to 35	Medium.

INTRAZONAL

Great soil group and series	Color and texture of profile	Drainage class	Parent material	Predominant slope range	Degree of development
Planosols:					
Almo	Grayish-brown silt loam over light-gray silty clay loam; a fragipan at a depth between 14 and 20 inches.	Poorly drained	Old mixed alluvium from loess and coastal plain material.	0 to 2	Strong.
Hatchie	Dark grayish-brown loam over light yellowish-brown loam or clay loam; a fragipan at a depth between 20 and 24 inches.	Somewhat poorly drained.	Old mixed alluvium from loess and coastal plain material.	1 to 3	Strong.
Robertsville	Grayish-brown silt loam over mottled light brownish-gray silty clay loam.	Poorly drained	Alluvium, chiefly from limestone.	0 to 2	Strong.
Taft	Grayish-brown silt loam over mottled yellowish-brown, gray, and light brownish-gray silt loam to silty clay loam.	Somewhat poorly drained.	Old mixed alluvium from loess, limestone, and coastal plain material.	0 to 2	Strong.

See footnotes at end of table.

TABLE 10.—*Classification of soil series by higher categories and some factors that have influenced soil formation*—Con.

INTRAZONAL—Continued

Great soil group and series	Color and texture of profile	Drainage class	Parent material	Predominant slope range	Degree of development
				Percent	
Rendzina:					
Sumter	Dark grayish-brown silty clay over light olive-brown clay.	Moderately well drained.	Selma chalk	10 to 25	Medium.
Low-Humic Gley:					
Beason	Dark grayish-brown silt loam over mottled, brownish silty clay loam that grades to silty clay.	Somewhat poorly drained.	Old alluvium, chiefly limestone.	0 to 2	Weak.
Lee	Dark grayish-brown silt loam over gray silt loam or silty clay loam.	Poorly drained	Alluvium, chiefly limestone.	0 to 2	Weak.
Melvin	Dark grayish-brown silt loam over mottled, gray and brown silt loam to silty clay loam.	Poorly drained	Alluvium, chiefly limestone.	0 to 2	Weak.
Waverly	Dark grayish-brown or grayish-brown silt loam or fine sandy loam over mottled light brownish-gray silt loam.	Poorly drained	Mixed alluvium from loess and coastal plain material.	0 to 2	Weak.
Humic Gley:					
Dunning	Very dark gray silty clay loam over dark gray silty clay.	Poorly drained to very poorly drained.	Fine-textured alluvium, chiefly from limestone.	0 to 2	Weak.

AZONAL

Great soil group and series	Color and texture of profile	Drainage class	Parent material	Predominant slope range	Degree of development
Alluvial:					
Bruno	Brown loamy fine sand over dark-brown, brown, or dark grayish-brown loamy fine sand, sandy loam, or sand.	Well drained to excessively drained.	Alluvium from limestone and sandstone.	0 to 3	Weak.
Collins	Brown silt loam, mottled and grayer at a depth of about 18 inches.	Moderately well drained.	Alluvium, loess, and coastal plain material.	0 to 3	Weak.
Egam	Dark-brown silty clay loam over very dark grayish-brown silty clay loam.	Well drained to moderately well drained.	Alluvium, chiefly from limestone.	0 to 3	Weak.
Ennis	Dark grayish-brown to brown silt loam over brown to yellowish-brown silt loam.	Well drained	Alluvium, chiefly from limestone.	0 to 3	Weak.
Falaya [5]	Brown or dark grayish-brown silt loam or loam that grades to mottled grayish-brown and yellowish-brown at a depth of 12 inches and becomes grayer with increasing depth.	Somewhat poorly drained.	Mixed alluvium from loess and coastal plain material.	0 to 3	Weak.
Huntington	Dark-brown or very dark grayish-brown silt loam or fine sandy loam.	Well drained	Alluvium, chiefly from limestone.	0 to 3	Weak.
Lindside	Brown to dark-brown silt loam becoming mottled at a depth of about 16 inches and grading to mottled grayish-brown or light brownish-gray silt loam or silty clay loam at a depth of about 24 inches.	Moderately well drained.	Alluvium, chiefly from limestone.	0 to 2	Weak.
Lobelville	Brown or dark grayish-brown silt loam that grades to mottled grayish-brown and gray silt loam.	Moderately well drained to somewhat poorly drained.	Alluvium, chiefly from cherty limestone.	0 to 2	Weak.

See footnotes at end of table.

TABLE 10.—*Classification of soil series by higher categories and some factors that have influenced soil formation*—Con.

AZONAL—CONTINUED

Great soil group and series	Color and texture of profile	Drainage class	Parent material	Predominant slope range	Degree of development
				Percent	
Mantachie [5]	Brown or grayish-brown fine sandy loam that grades to light brownish-gray or gray fine sandy loam at a depth of 20 inches.	Somewhat poorly drained.	Mixed alluvium from loess and coastal plain material.	0 to 2	Weak.
Newark [5]	Dark grayish-brown silt loam grading to mottled light brownish-gray silt loam at a depth of 15 inches.	Somewhat poorly drained.	Alluvium, chiefly limestone.	0 to 2	Weak.
Vicksburg	Brown silt loam and fine sandy loam.	Well drained	Mixed alluvium from loess and coastal plain material.	0 to 3	Weak.
Lithosols:					
Dandridge	Brown shaly silt loam over yellowish-brown shaly silt loam to silty clay loam.	Well drained	Calcareous shale	8 to 35	Medium.
Regosols:					
Bodine	Light yellowish-brown cherty silt loam over yellowish-brown very cherty silt loam or cherty silty clay loam.	Well drained to excessively drained.	Very cherty limestone	5 to 35	Weak.
Guin	Dark-gray to pale-brown or light yellowish-brown gravelly sandy loam over gravel beds.	Excessively drained.	Gravel and sand	20 to 35	Weak.

[1] Red-Yellow Podzolic soils that have a fragipan.
[2] Red-Yellow Podzolic soils that are intergrading toward Reddish-Brown Lateritic soils.
[3] Red-Yellow Podzolic soils that are intergrading toward Alluvial soils.
[4] Alluvial soils that are intergrading toward Humic Gley soils.
[5] Alluvial soils that are intergrading toward Low-Humic Gley soils.

General Nature of the Area

In this section physiography, relief, and drainage; geology; water supply; and the climate of Hardin County are discussed. Information is also given about the settlement and development of the county and about community facilities, industry, and transportation and markets. Also given are facts about sizes and types of farms, farm tenure, crops, and other information pertinent to farming in the county. The statistics on agriculture are from reports published by the United States Bureau of the Census.

Physiography, Relief, and Drainage

There are three main physiographic divisions in Hardin County. They are (1) the Highland Rim, (2) the valley of the Tennessee River, and (3) the slope of west Tennessee.

The eastern part of the county is within the western slope of the Highland Rim province and makes up about 60 percent of the county. The Highland Rim is a highland plain that has been cut into by young streams, which have left hills and ridges of approximately the same altitude.

The area within the valley of the Tennessee River consists of the present flood plain and of recent terraces. It makes up about 10 percent of the county.

The region within the slope of west Tennessee comprises about 30 percent of the county. More areas of somewhat poorly drained and poorly drained soils and of swampy land are within this division than in other parts of the county. Also, the upland areas, which are undulating to steep, are more erodible.

In general, the land surface of the county is a mass of low, rolling hills and level bottoms. Most of the area is rolling to hilly, but the relief ranges from level to very steep. The eastern part of the county is predominantly rolling to hilly. In the valley of the Tennessee River the areas are mostly level or nearly level. The region within the slope of west Tennessee is nearly level to steep. Elevations range from 355 to 800 feet above sea level. The highest elevation is in the eastern part of the county, and the lowest is in the northern part of the county, near the place where the Tennessee River turns to flow along the border of Decatur County. The elevations of the valley of the Tennessee River range from about 355 to 450 feet above sea level. The difference in elevation between the stream bottoms and the adjacent crests of hills is about 175 to 180 feet in most places.

The county lies wholly within the drainage system of the Tennessee River, which meanders north through the county, somewhat west of the central part, and then forms the northeastern boundary. The drainage system is well defined and has only a few depressional areas or sinks.

Smaller streams flow into the Tennessee River throughout its length; intermittent streams are abundant in all parts of the county. The eastern part of the county has a well-defined, trellislike drainage pattern and many intermittent streams. Horse, Indian, and Hardin Creeks flow from the Highland Rim section and empty into the Tennessee River. In the valley of the Tennessee River, the streams flow at a slower rate than those to the east, and in many places the channels of the streams are not stabilized. The sloping area west of the Tennessee River is drained by Chambers, Lick, Snake, White Oak, and Doe Creeks. These creeks flow into the Tennessee River; they are more sluggish than the creeks in the eastern part of the county.

Geology

In the Highland Rim physiographic division, the valley floors are underlain by limestone at a depth between 15 and 20 feet. Within this physiographic division lie terrace, coastal plain, limestone, shale, and sandstone formations, many of which are not common to other Highland Rim areas but mesh together in the hills of eastern Hardin County.

Terrace material was deposited at elevations ranging from 450 to 800 feet at six different periods during Quaternary times. Sand, clay, and gravel of the Coastal Plains were deposited on this region during Cretaceous times. The terrace and coastal plain deposits rest upon unconforming limestone, shale, or sandstone formations. The formations, listed in descending order, are (1) Warsaw formation, chiefly chert weathered from the formation; (2) Fort Payne chert; (3) Ridgetop shale; (4) Chattanooga shale; (5) Harriman chert; (6) Quall limestone; (7) Decaturville chert; (8) Birdsong shale; (9) Olive Hill formation; (10) Rockhouse shale; (11) Decatur limestone; (12) Brownsport formation; (13) Wayne formation; (14) Brassfield formation; (15) Fernvale formation; and (16) Hermitage formation.

That part of the county within the valley of the Tennessee River consists of alluvial deposits capped by loess. The alluvial deposits rest on limestone bedrock, which lies at a depth between 40 and 60 feet. Within this region the soils are younger than in the other physiographic regions in the county. Stream channels are not stabilized in all places, and deposits are still being laid down by the streams.

In this county the principal formations within the area on the slope of west Tennessee are terrace, coastal plain, and loessal deposits. Terrace deposits occur throughout the region at varying elevations, from Crump to Counce, and on to Saltillo. The coastal plain deposits are from the Selma formation. The Selma formation is plastic, nearly white sandy clay that is micaceous and calcareous and contains some greensand. Soils from this formation are in the northwestern section of the county in the vicinity of Morris Chapel. Dispersed throughout the region are soils from friable sand and clay of the Eutaw formation. A layer of loess has been deposited over much of the slope of west Tennessee.

Water Supply

The water supply in Hardin County is generally adequate for farm homes and livestock. Most of the farm homes in the eastern part of the county are supplied with water from springs and wells. Water for livestock is obtained from permanent and intermittent streams. On the higher ridges an occasional farm pond is used to supply water for livestock. There are more wells and ponds in the western part of the county than in the eastern part. In many places wells have dried up in recent years because of the fluctuating water table.

As the result of the extension of electric power into the rural areas, many farmers now use deep-well pumps in wells and shallow-well pumps in springs to help maintain a steady supply of water. Many farms have piped, running water. Cisterns and storage tanks are used in places to supplement the main water supply.

Water for domestic use in the city of Savannah and for recreational and industrial uses throughout the county is supplied by the Tennessee River. Smaller streams that provide water are Chambers, Snake, Lick, and White Oak Creeks in the western part of the county and Horse, Indian, and Hardin Creeks in the eastern part.

Climate [6]

In Hardin County the summers are hot and the winters are mild. Rainfall generally is abundant. Climatic data for the county, compiled from records of the United States Weather Bureau at Savannah, are given in table 11.

TABLE 11.—*Temperature and precipitation at Savannah, Hardin County, Tennessee*

[Elevation, 440 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1941)	Wettest year (1932)	Average snowfall
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
January	42. 4	79	−12	5. 94	3. 69	11. 90	2. 8
February	45. 1	81	−10	5. 00	. 75	6. 55	. 8
March	52. 2	90	6	6. 24	2. 59	4. 80	. 4
April	61. 5	91	23	4. 57	2. 54	4. 05	0
May	68. 8	99	32	4. 40	1. 18	. 49	0
June	77. 3	108	43	4. 33	1. 41	6. 32	0
July	80. 4	112	47	3. 83	7. 36	9. 34	0
August	79. 6	108	44	4. 22	3. 53	4. 34	0
September	74. 1	111	33	3. 35	. 19	8. 50	0
October	62. 9	97	24	3. 28	3. 73	6. 83	0
November	51. 2	85	1	4. 45	4. 32	3. 05	. 2
December	43. 7	79	0	4. 91	4. 29	8. 50	. 8
Year	61. 6	112	−12	54. 52	35. 58	74. 67	5. 0

[1] Average temperature based on a 69-year record, through 1955; highest temperature based on a 66-year record and lowest temperature based on a 64-year record, through 1952.

[2] Average precipitation based on a 73-year record, through 1955; wettest and driest years based on a 72-year record, in the period 1883–1955; snowfall based on a 19-year record, through 1952.

The following estimates of weather conditions in Hardin County are based on data from full-time weather

[6] This section was prepared by R. R. DICKSON, State climatologist, U.S. Weather Bureau, Nashville, Tenn., and D. K. SPRINGER, State soil conversationist, Soil Conservation Service, Nashville, Tenn.

offices of the Weather Bureau in Tennessee and surrounding states. During the year there is an average of 117 days with precipitation of 0.01 inch or more. Thunderstorms occur on an average of 53 days a year. Relative humidity averages about 70 percent annually. The maximum average for any month is 75 percent, in January; the minimum average for any month is 66 percent, in April.

Prevailing winds are generally from the south, and the average annual wind speed is 7 miles per hour. The average wind speed ranges from a maximum of about 9 miles per hour in March to a minimum of about 5 miles per hour in August. Generally, the lightest winds occur just before sunrise, and the strongest, early in the afternoon. The average daily wind speed is about 4 or 5 miles per hour. Cloudiness, or average sky cover, averages about 0.6 and ranges from a low of 0.4 in October to a high of 0.7 during winter and early in spring.

Precipitation

Normal precipitation in the county exceeds, by about 4 inches, the statewide yearly average of 50.5 inches. More precipiation falls in winter and spring than at other times because large storms pass over the State more often during those seasons. Precipitation is lightest in fall because at that time there are more high-pressure areas that move slowly and suppress rain.

A recent study based on the energy and intensity of rainfall [7] shows that Hardin County has one of the highest rainfall index ratings in the State. The rainfall erosion index ranges from 270 in the northeastern part of the county to 310 in the southwestern, and range for the State is from 140 to 320. The rainfall erosion index is a numerical rating that expresses the capacity of rainstorms to erode soil from unprotected fields during the year. Other conditions remaining constant, the higher the index value, the greater the loss of soil material.

There is no season in west Tennessee when the hazard of erosion is low. Soils used for cotton, corn, or other row crops are often bare during much of May when the seedbed is prepared and the crops are planted. The crops provide little protective cover until about 2 months after they are planted. During this time the hazard of erosion is high. Furthermore, about one-third of the annual storms that cause erosion occur during this period. Unless suitable cropping systems and other practices to help prevent erosion are used, particularly on the sloping soils, much damage will be caused through erosion.

Severe storms are infrequent in Hardin County. Between 1916 and 1956 only three tornadoes were reported in the county. Destruction from tropical storms is rare. In a recent 40-year period, blizzards were nonexistent. Hailstorms occur mostly in spring, and they are observed about three times a year in any one place. The largest amount of precipitation recorded in Hardin County in a year was 75.52 inches at Shiloh in 1948, and the least was 33.11 inches at Pickwick Landing in 1941.

Temperature and growing season

The average daily minimum temperature is in the middle or upper 60's, and the maximum daily temperature is about 90° F. In winter the average daily temperature ranges from about freezing to a high in the lower 50's. Each year, on the average, temperatures exceed 90° on about 70 days, drop below 32° on about 55 days, and fall to zero or below on about 1 day. The soil is rarely frozen to a depth of more than 3 inches, and it seldom remains frozen longer than 5 or 6 days.

The growing season, which is the interval between the last temperature of 32° F. or lower in spring and the first in fall, ranges from about 195 days in the northeastern part of the county to about 210 days in the southwestern part. At Savannah the average date of the last freezing temperature in spring is April 3, and that of the first freezing temperature in fall is October 26.

Probabilities of freezing temperatures are shown in figure 12. To determine from figure 12 the probability that there will be a temperature at Savannah of 28° or lower after April 1, lay a rule vertically on the April 1 line. Look to the left from the point where the rule crosses the diagonal 28° line, and read the percentage listed at the side of the graph. For this example the probability is between 20 and 30 percent, or about 3 years in 10. In the same manner you can determine from figure 13 the probability that the temperature listed will occur before any date in fall.

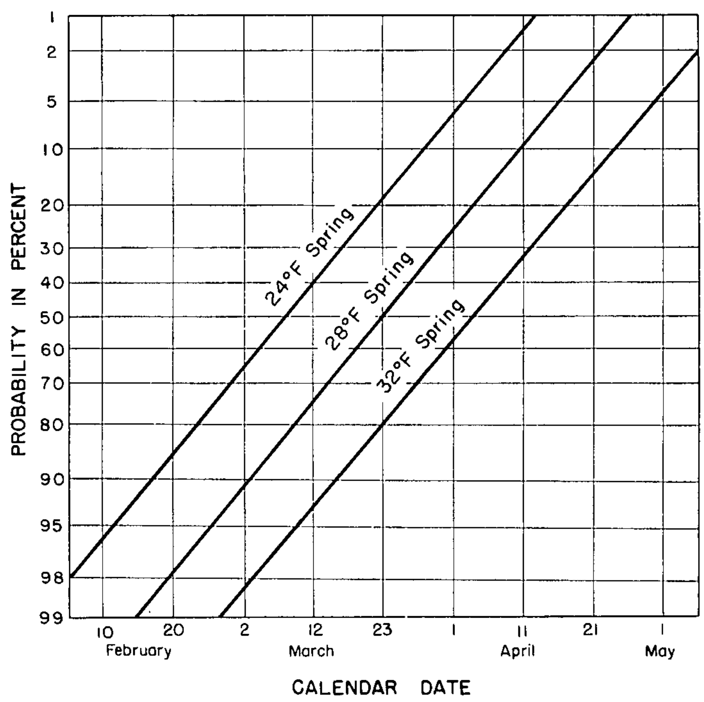

Figure 12.—**Probability that the temperature at Savannah, Tenn., will be 24° F. or lower, 28° or lower, or 32° or lower after the date indicated in spring.**

A freezing temperature between 28° and 32° F. causes little or no damage to most plants. This temperature may not damage plants hardened by drought or by low temperature on sunny days, but it may kill tomatoes, peppers, and other tender plants. Also, the anthers of small grains may be destroyed, as well as the pistils and anthers of strawberries and other flowering plants. Thus, the yield of these plants may be reduced.

[7] Unpublished data by W. H. WISCHMEIER, analytical statistician, Eastern Soil and Water Management Branch, Agriculture Research Service, U.S. Dept. of Agr., Lafayette, Ind.

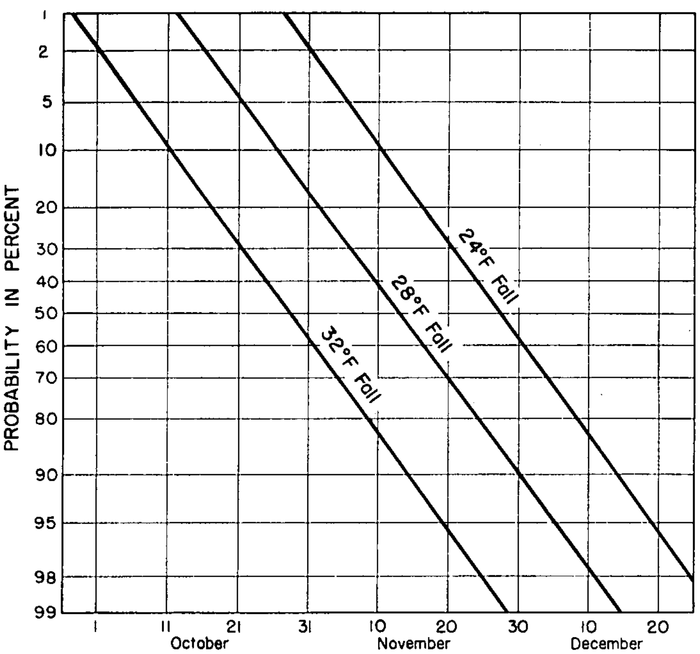

Figure 13.—**Probability that the temperature at Savannah, Tenn., will be 24° F. or lower, 28° or lower, or 32° or lower before the date indicated in fall.**

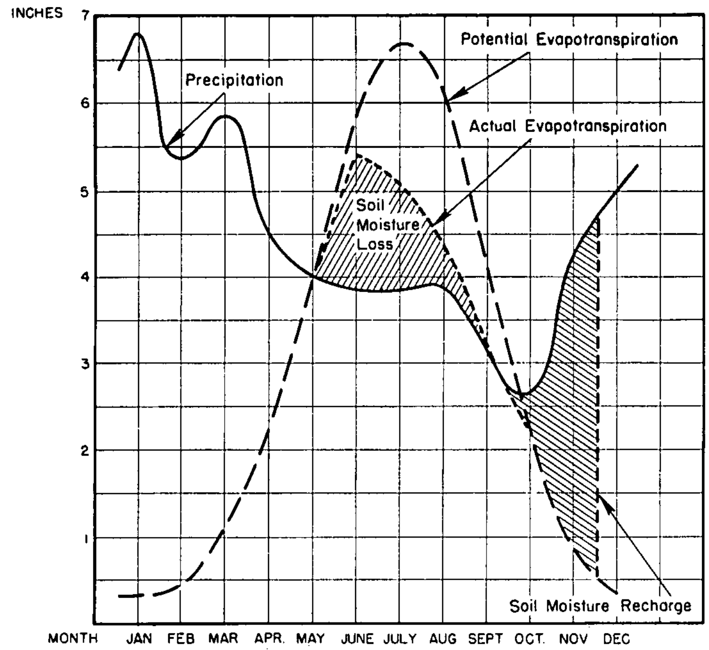

Figure 14.—**Average precipitation and evaptranspiration at Savannah, Tenn., computed from data recorded from 1931 through 1952. Average water-holding capacity assumed to be 4 inches per foot of soil.**

Some damage is caused to most plants by a temperature of 24° to 32° F. This temperature will probably destroy tender plants, and it heavily damages fruit blossoms and semihardy plants. A temperature of 24° or lower causes heavy damage to all plants.

Evapotranspiration

Shown in figure 14 are curves for monthly precipitation, potential evapotranspiration, and actual evapotranspiration at Savannah, Tenn. The data used in this figure were computed by the Thornthwaite method (7). The curves show when there is a deficit or surplus of soil moisture in the normal years.

The curve for potential evapotranspiration shows amount of moisture lost from a soil covered with vegetation and constantly wetted to field capacity. Field capacity is the largest amount of moisture a soil will hold, under conditions of free drainage, after the excess water has drained away following a rain or an irrigation. The curve for actual evapotranspiration shows the amount of moisture lost from a soil that receives only the moisture normally available, or that amount shown by the precipitation curve.

Actual evapotranspiration differs from potential evapotranspiration because, as soils dry, there is progressively less moisture available for loss. The vertical distance between the actual and potential evapotranspiration in figure 14 indicates the deficit in water, or the amount of irrigation water that would be needed to maintain maximum plant growth.

The precipitation and evapotranspiration curves in figure 14 show moisture conditions at the end of each month, not daily conditions. In the average year from January through April, precipitation is greater than estimated actual evapotranspiration. From May through September the loss of soil moisture, or estimated actual evapotranspiration, e x c e e d s precipitation, and the soil progressively dries out. By the end of September, on the average, 3.47 inches of the original 4 inches of available water have been removed from the soil. This amount is indicated by the vertical distance between the point where the actual evapotranspiration curve crosses the September line and the highest point of that curve.

During the period from May through September, vigorously growing plants draw heavily on the available moisture in the soil. The rate of plant growth is related to the amount of available moisture in the soil. The vertical distance between the actual and potential evapotranspiration curves indicates the amount of moisture needed to maintain maximum plant growth. By October, precipitation again exceeds evapotranspiration, and the excess water begins to recharge the soil. This recharge is completed in November; then part of the excess precipitation runs off the surface and part of it is added to the ground water. During the year, 23.60 inches more water is received in precipitation than is lost in evapotranspiration.

Drought days

Knowledge of the frequency and distribution of drought days during the growing season is useful in selecting crops and planting dates for individual soils. Drought days are also useful in determining if the supply of water is adequate or if water should be supplied. For example, if drought occurs at the time corn is tasselling, yields will be reduced. The risk can be lowered if corn is planted early on soils that have high available moisture-storage capacity, or about 4 to 6 inches of available moisture.

Table 12 shows the moisture deficit in the driest year in 10, for soils that have different capacities to store water. If the moisture capacity of a soil is known, this table can be used along with table 13, which gives the number of drought days expected each month at different levels of probability, to determine if water should be supplied for the soil. The moisture capacity for a number of soils is given in the Available Water Capacity column in table 6, in the section "Engineering Uses of the Soils." Thus, the advisability of planting a particular crop can be appraised by (1) determining from table 6 the amount of moisture the soil can supply within the depth to which roots of that crop penetrate, and (2) reading from table 13 the various chances of drought during the growing season of the crop selected.

TABLE 12.—*Moisture deficit, in the driest year in 10, for soils with different capacities to store water*

Soil moisture storage capacity	April	May	June	July	August	September	October
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
1 inch	1.8	3.4	4.9	4.5	4.5	3.2	1.9
2 inches	0.7	2.8	4.7	4.3	4.3	3.0	1.8
3 inches	------	2.2	4.5	4.2	4.2	2.9	2.7
4 inches	------	1.0	3.6	4.2	4.2	2.9	1.7
6 inches	------	------	1.8	4.0	4.0	2.9	1.6

TABLE 13.—*Probabilities of drought days on soils of different available moisture-storage capacities*

[Dashes indicate less than 1 drought day]

Month [1]	Probability	Minimum drought days if soil has available moisture storage capacity of—				
		1 inch	2 inches	3 inches	4 inches	6 inches
April	1 in 10	14	5	1	0	0
	2 in 10	10	2	------	0	0
	3 in 10	8	1	------	0	0
	4 in 10	6	------	------	0	0
	5 in 10	4	------	------	0	0
May	1 in 10	23	19	15	7	1
	2 in 10	19	17	11	3	------
	3 in 10	16	12	6	2	------
	4 in 10	14	7	2	1	------
	5 in 10	12	5	1	------	------
June	1 in 10	27	26	25	20	10
	2 in 10	24	23	18	13	5
	3 in 10	20	18	15	11	1
	4 in 10	15	13	12	8	------
	5 in 10	13	10	9	5	------
July	1 in 10	25	24	23	21	21
	2 in 10	23	22	20	16	12
	3 in 10	21	20	17	14	5
	4 in 10	19	16	15	12	2
	5 in 10	17	13	12	9	1
August	1 in 10	28	27	26	26	25
	2 in 10	24	23	22	21	17
	3 in 10	20	17	16	15	13
	4 in 10	17	14	13	13	10
	5 in 10	14	12	12	11	7
September	1 in 10	25	23	22	22	22
	2 in 10	23	20	19	17	17
	3 in 10	20	15	14	13	13
	4 in 10	18	13	12	12	10
	5 in 10	16	11	10	10	6
October	1 in 10	24	23	21	21	20
	2 in 10	21	19	16	16	15
	3 in 10	18	16	13	12	11
	4 in 10	14	13	9	8	7
	5 in 10	11	8	5	4	4
April through October	1 in 10	131	110	96	84	78
	2 in 10	121	100	86	75	59
	3 in 10	112	90	76	68	51
	4 in 10	104	80	66	60	45
	5 in 10	90	70	57	49	37

[1] Months of January, February, March, November, and December are not shown, because crops are rarely damaged by drought in these months.

The information in table 13 is based on the occurrence of drought days at Savannah. It is from a recent study based on daily precipitation, on the capacity of the soil to store available moisture, and on estimated daily evapotranspiration (*2*). In table 13 a drought day is a day on which the supply of moisture available to plants in the root zone of a soil is exhausted. Available moisture-storage capacity is the amount of moisture a soil can hold that is available for plant roots. Evapotranspiration computations used were obtained by the Penman method (*2*). In determining changes in soil moisture, evapotranspiration is assumed to be at the rate of potential evapotranspiration; that is, the rate of evapotranspiration if the soil is kept moist.

Generally, the climate in Hardin County is well suited to small grains sown in fall and to other crops that mature early. It is also suited to cotton, lespedeza, and other crops that need a long growing season and that can withstand dryness during the last stages of growth and maturity.

The lack of moisture and high temperatures in July and August reduce the growth and yields of pastures in many places. The risk of shortage of grazing in summer can be decreased if bermudagrass, lespedeza, sudangrass, millet, and other plants that grow well in warm seasons are grown on soils that have high available moisture capacity. In fall, drought days are common on soils that have low moisture-storage capacity. Thus, seeding dates

and growth of plants are often delayed in fall and the danger that plants will be winterkilled is increased.

Settlement and Development

Hardin County was first settled in 1816 when 26 settlers came to the area. The county was established in 1820 and named in honor of Col. Joseph Hardin.

By 1840, there were more than 8,000 inhabitants in the county. Most of them came from Virginia and North Carolina. The present population, particularly in the rural areas, consists mainly of descendants of these early settlers. According to the United States Bureau of the Census, there were 17,397 people in the county in 1960. Of these, 75.2 percent were rural and the rest were urban.

The main occupations of the early settlers were farming and lumbering. In recent years, there has been a steady increase in the number of people who live in towns and work in various kinds of industries. Many of the farmers now operate their farms part of the time and depend upon employment in industries for part of their income.

Community Facilities

All communities in Hardin County have schools and churches. Almost all parts of the county have schoolbus service and rural mail delivery. Telephones serve most areas, and practically all homes have electric power.

The county is well supplied with recreational facilities. Pickwick Lake, the Tennessee River, and several small streams provide boating, fishing, and water skiing. The reservoir at Kentucky Dam, also on the Tennessee River, raises the water level for several miles in the county. The Shiloh National Military Park, a Civil War battlefield, lies west of the Tennessee River in Hardin County. This park and Pickwick Landing Dam are the leading tourist attractions.

Industry

In recent years there has been a substantial increase in the number of people in the county who work in industry. Some of the people are employed within the county, but many of them work in plants in the surrounding counties.

The main businesses are concerned with processing food and in manufacturing of wearing apparel or processing of lumber, paper, or leather goods. There is also one printing plant and two stone or clay operations. Other industries are concerned with supplying gravel for roads, collecting mussel shells for making buttons, raising live bait for fishing, and fishing for commercial purposes.

The Pickwick Landing Dam, which also serves to prevent floods, produced more than 1 billion kilowatt-hours of electricity in 1959, and there were more than 11,000 vessels locked through the dam in the same year.[8]

Transportation and Markets

Hardin County has one Federal highway and many State and county roads that are hard surfaced. Most rural roads are in excellent condition.

In addition to the highways, the Tennessee River, which meanders through the county, provides barge transportation. The only railroad is a spur line that serves the papermill at Counce.

Farm to market transportation is good. The principal markets for the agricultural products of the county are Memphis, Nashville, and Jackson, within the State, and Florence, Ala. Savannah is the most important market and trading center within the county.

Sizes and Types of Farms

Farmers occupied 52.5 percent, or 197,122 acres, of the total land area of Hardin County in 1959. Of this, about 53 percent, or 105,271 acres, was in woodland. The farms vary greatly in size, but most of them are small. In 1959, there were 16 farms that consisted of 1,000 or more acres. The average-sized farm was 149.2 acres. The census listed the number of farms in 1959, by size, as follows:

Size of farms, acres:	*Number*
Under 10	97
10 to 49	330
50 to 69	156
70 to 99	186
100 to 139	156
140 to 179	96
180 to 219	77
220 to 259	43
260 to 499	122
500 to 999	42

The farm enterprises are not greatly diversified, and the products on many of the farms are for home use. In 1959, 638 of the farms were miscellaneous and unclassified. The rest are listed according to their major source of income as follows:

	Number
Livestock other than dairy or poultry	238
Field crops, total	350
Cash grain	25
Cotton	325
Vegetable	5
Dairy	5
Poultry	20
General farms	65

Tenure

In 1959, there were 1,321 farms in the county. Of these, owners operated about 48 percent, and tenants, 23.2 percent. Part owners operated 28.5 percent of the farms. Only two farms were operated by managers.

The number of part-time farmers has increased in recent years. According to the 1959 census, the income earned from nonfarm sources by the families on 575 farms exceeded the value of farm products sold from these farms. There were 364 farmers who worked off the farm 100 or more days.

Crops

Farming in Hardin County is less diversified than in other parts of Tennessee. On many of the farms the main crop is cotton, which is sold for cash. Where farming is more diversified, much of the grain or hay that is grown is fed to the livestock. The acreage of the principal crops in the county and the number of fruit and nut trees in specified years is shown in table 14.

[8] Tennessee Valley Authority, Office of Information, Knoxville, Tenn.

TABLE 14.—*Acreage of the principal crops and number of fruit trees*

Crop	1954	1959
	Acres	*Acres*
Corn for all purposes	35, 366	28, 618
Cotton	10, 583	7, 031
Small grains harvested:		
Wheat	908	320
Oats	1, 128	90
Barley	204	32
Soybeans grown alone for all purposes	2, 325	1, 359
Hay crops, excluding sorghum, soybeans, and cowpea hay	6, 376	3, 756
Alfalfa and alfalfa mixtures	141	27
Clover, timothy, and grass mixtures	561	450
Lespedeza	4, 569	3, 014
Small grains	442	73
Other hay cut	663	192
Land in bearing and nonbearing fruit orchards, groves, vineyards, and planted nuts	222	93

Corn is grown on nearly all of the farms. It is the most important crop that is fed to the livestock. Most of the corn and soybeans that are sold go to local grain dealers and are trucked to outside markets. The hay crops, mainly annual lespedeza and johnsongrass, are fed to the livestock. Red clover, soybeans, and alfalfa are grown on a few widely scattered areas and are harvested for hay. On many farms pimento peppers are grown as a cash crop. Irish potatoes were harvested for home use or sale on 777 farms, and sweetpotatoes on 374. Other vegetables are grown for home use on most farms; they were reported sold from 80 farms in 1959.

Corn is planted in April on the sandier uplands, and from May 1 to July 10 on the bottom lands. Cotton is planted April 15 to May 20. Wheat is the small grain that is grown most. It is sown in fall and harvested in June. Most seeding for hay is done in spring in corn or cotton stubble. Pimento peppers are planted in May.

Livestock

The livestock of Hardin County are mainly hogs, cattle, horses, mules, and chickens. Table 15 gives the number of livestock on farms in stated years. The trend is toward an increase in beef cattle and in swine. All other livestock have decreased. Several farmers in the county produce broilers or eggs for the commercial market.

TABLE 15.—*Livestock on the farms*

Livestock	1954	1959
	Number	*Number*
Cattle and calves	9, 523	8, 258
Milk cows	2, 705	1, 152
Steers and bulls	1, 789	1, 645
Horses and mules	1, 598	926
Hogs and pigs	14, 138	26, 650
Sheep and lambs	317	431
Chickens 4 months old and older	69, 588	52, 536

Pastures

About 23 percent of the farmland, or 45,149 acres, was pastured in 1959. Of this, about 49 percent was woodland used for pasture. A large number of the pastures are on soils not well suited to crops.

A small acreage has been improved for pastures by liming, by adding fertilizer, or by seeding to grasses or legumes. Some was improved by irrigating, by draining, or by controlling weeds and brush. In many places the soils in the improved pastures are too steep or eroded for crops.

The most common plants in the permanent pastures are tall fescue, whiteclover, bermudagrass, johnsongrass, and annual lespedeza. Sudangrass is grown on a few farms to provide supplemental grazing in summer.

Farm Power

Tractors have largely replaced the horses and mules, which once provided most of the farm power. Modern machinery is generally used on the larger farms in the more nearly level areas. If wetness prevents the use of heavy machinery, horse power is used on these areas for planting and harvesting. In the hilly areas and on very small farms, much work is done with horse-drawn implements. Also, more hand labor is used than on large farms.

Approximately two-thirds of the corn grown in the county is harvested by mechanical cornpickers. Most of the soybeans, small grains, and grain sorghum are harvested by combines. Except, on the small farms, the majority of the hay crops are baled. Cotton and pepper crops require the most hand labor of any crop.

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Glossary

Acidity. See Reaction.

Alluvium. Sand, mud, and other sediments deposited on land by streams.

Available moisture capacity. The amount of moisture a soil can hold that is available to roots of plants. This is approximately the amount of moisture held between one-third atmosphere and 15 atmospheres of tension.

Bedrock. The solid rock underlying the soils and other earthy surface formations.

Catena, soil. A group of soils within a specific soil zone that have developed from similar parent material but are unlike in characteristics because of differences in relief or drainage.

Chert. A structureless form of silica (SiO_2), very closely related to flint, that breaks into angular fragments. Soils developed from impure limestone that contains fragments of chert and that have large quantities of these fragments in the soil mass are called cherty soils.

Clay. (1) As a soil separate, the small mineral soil grains, less than 0.002 millimeter in diameter. (2) As a textural class, soil material that contains 40 percent or more of clay, as defined under (1), less than 45 percent of sand, and less than 40 percent of silt.

Colluvium. Mixed deposits of soil material and rock fragments that have accumulated near the bases of slopes through soil creep, slides, or local wash.

Consistence, soil. The nature of soil material that is expressed by the resistance of the individual particles to separating from one another (cohesion) or by the ability of a soil mass to undergo a change in shape without breaking (plasticity). The consistence varies with the moisture content. Thus, a soil aggregate or clod may be hard when dry and plastic when wet. Terms used to describe consistence are—

Friable. When moist, easily crushed by hand and coheres when pressed together. Friable soils are easily tilled.

Firm. When moist, crushes under moderate pressure, but resistance is distinctly noticeable. Firm soils are likely to be difficult to till.

Hard. When dry, is moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between thumb and forefinger.

Loose. Noncoherent when moist or dry. Loose soils are generally coarse textured and are easily tilled.

Plastic. When wet, retains an impressed shape and resists being deformed; plastic soils are high in clay and are difficult to till.

Soft. Weakly coherent and fragile; when dry, breaks to powder or individual grains under slight pressure.

Cull trees. A tree of merchantable size rendered unmerchantable by poor form, limbiness, rot, or other defect.

Eluviation. The movement of soil material from one place to another within the soil in either true solution or colloidal suspension. Soil horizons that have lost material through eluviation are referred to as *eluviated;* those that have received material, as *illuviated.*

Erosion. The detachment and movement of the solid material of the land surface by wind, moving water, or ice, and by such processes as landslides and creep.

First bottom. The normal flood plain of a stream; may be subject to frequent or infrequent overflow.

Fragipan. A loamy, brittle horizon that is very low in organic matter and clay and rich in silt or very fine sand. The layer is seemingly cemented when dry, has a hard or very hard consistence, and has a high bulk density in comparison to the horizon or horizons above it. When moist, the fragipan has a tendency to rupture suddenly when pressure is applied rather than to undergo slow deformation. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick and generally occur below the B horizon at a depth of 15 to 40 inches from the surface.

Gravelly. Soils that have rounded or angular fragments, not prominently flattened, up to 3 inches in diameter, that occupy 20 percent of the soil volume; in very gravelly soils the fragments occupy 50 to 90 percent of the soil mass.

Horizon. A layer of soil, approximately parallel to the soil surface, that has characteristics produced by soil-forming processes. The relative positions of the several soil horizons in the soil profile and their nomenclature follow:

Horizon A. The master horizon consisting of (1) one or more mineral horizons of maximum organic accumulation; or (2) surface or subsurface horizons that are lighter in color than the underlying horizon and that have lost clay minerals, iron, and aluminum with resultant concentration of the more resistant minerals; or (3) horizons belonging to both of these categories.

Horizon B. The master horizon of altered material characterized by (1) an accumulation of clay, iron, or aluminum, with accessory organic material; or (2) blocky or prismatic structure together with other characteristics, such as stronger colors, unlike those of the A horizons or the underlying horizons of nearly unchanged material; or (3) characteristics of both these categories. Commonly, the lower limit of the B horizon corresponds to the lower limit of the solum.

Horizon C. A layer of unconsolidated material, relatively little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a part of the overlying solum has developed.

Horizon D. Any stratum underlying the C, or the B if no C is present, which is unlike the C or unlike the material from which the solum has been formed.

Moisture-supplying capacity. The relative capacity of the soil to take in and hold moisture in amounts that are favorable to most plants. It reflects slope, rate of infiltration, moisture retentiveness, and depth of the soil. Relative moisture-supplying capacity is expressed as *very high, moderately high, high, moderately low, low,* or *very low.*

Mixed stand (trees). A stand of trees in which less than 80 percent of the trees in the main canopy are of a single species.

Morphology, soil. The constitution of the soil expressed in the kinds of horizons, their thickness and arrangement in the profile, and their texture, structure, consistence, color, and other chemical and biological properties.

Mottles, soil. Contrasting color patches that vary in number and size. Descriptive terms are as follows: Contrast—*faint, distinct,* and *prominent;* abundance—*few, common,* and *many;* and size—*fine, medium,* and *coarse.* The size measurements are: Fine, commonly less than 5 millimeters (about 0.2 in.) in diameter along the greatest dimension; medium, commonly ranging between 5 and 15 millimeters (about 0.2 to 0.6 in.) along the greatest dimension; and coarse, commonly more than 15 millimeters (about 0.6 in.) along the greatest dimension.

Parent material. (See also Horizon C; Profile, soil; and Substratum.) The unconsolidated materials from which the soil has formed.

Parent rock. The rock from which the parent materials of soils are formed.

Permeability. The quality of the soil that enables it to transmit water and air. It can be measured in terms of rate of flow of water through a unit cross section of saturated soil in unit time. Rates are expressed in inches per hour, as follows:

	Inches per hour
Very slow	Less than 0.05
Slow	0.05 to 0.20
Moderately slow	0.20 to 0.80
Moderate	0.80 to 2.50
Moderately rapid	2.50 to 5.00
Rapid	5.00 to 10.00
Very rapid	More than 10.00

Phase, soil. A subdivision of a soil type having variations in characteristics that are not significant to the classification of the soil in its natural landscape but that are significant to the use and management of the soil. The variations are chiefly in external characteristics, such as slope, stoniness, or erosion.

Profile, soil. Vertical section of the soil through all its horizons and extending into the parent material.

Reaction. The degree of acidity or alkalinity of the soil mass expressed in pH values, or in words, as follows:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6–7.3
Very strongly acid	4.5–5.0	Mildly alkaline	7.4–7.8
Strongly acid	5.1–5.5	Moderately alkaline	7.9–8.4
Medium acid	5.6–6.0	Strongly alkaline	8.5–9.0
Slightly acid	6.1–6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of the land surface considered collectively.

Residual material. Soil material that has weathered or developed in place. Presumably developed from the kind of rock on which it lies.

Series, soil. A group of soils that have genetic horizons similar, except for the texture of the surface soil, as to differentiating characteristics and arrangement in the soil profile, and developed from a particular type of parent material. A series may include two or more soil types that differ from one another in the texture of the surface soil.

Solum. The upper part of the profile, above the parent material, in which processes of soil formation are active.

Structure, soil. The arrangement of individual soil particles into aggregates with definite shape or pattern. *Crumb, granular, platy, prismatic, columnar, angular, subangular,* and *blocky* are terms used to describe soil structure.

Subsoil. Commonly, that part of the profile below plow depth; technically the B horizon.

Substratum. (See also Horizon C and Parent material.) Any layer lying beneath the solum.

Surface soil. Commonly that part of the profile that is ordinarily stirred by tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. Technically, the A horizon.

Terrace, geologic. An old alluvial plain, generally flat or undulating, that borders a stream; frequently called second bottom, as contrasted with flood plain; seldom subject to overflow. In this county there are some low terraces just above the flood plain. Others that are older and higher are generally 400 to 800 feet above sea level.

Texture, soil. The relative proportions of the various size groups of individual soil grains in a mass of soil. Specifically, it refers to the proportions of sand, silt, and clay. A coarse-textured soil is one with a high content of sand; a fine-textured soil has a large proportion of clay.

Tilth. The physical condition of a soil in respect to its fitness for growing a specified plant or sequence of plants.

Type, soil. A subdivision of the soil series based on the texture of the surface soil.

GUIDE TO MAPPING UNITS

[See table 1, p. 9, for acreage and proportionate extent of the soils, and table 2, p. 68, for estimated crop yields. To find the engineering properties of the soils, see the section beginning on p. 83. Dashes indicate the soil was not given a capability classification]

			Capability unit		*Woodland group*	
Map symbol	*Soil*	*Page*	*Symbol*	*Page*	*Number*	*Page*
Am	Almo silt loam	10	IVw-1	65	7	81
Ba	Beason silt loam	11	IIw-1	61	7	81
BdD	Bodine cherty silt loam, 5 to 12 percent slopes	12	IVs-1	66	9	81
BdF	Bodine cherty silt loam, 12 to 35 percent slopes	12	VIIs-1	67	9	81
BeF	Bodine-Guin complex, 20 to 35 percent slopes	12	VIIs-1	67	9	81
BfC	Boswell fine sandy loam, 2 to 8 percent slopes	13	IIIe-3	63	5	80
BfD	Boswell fine sandy loam, 8 to 12 percent slopes	13	VIe-2	66	5	80
BoC3	Boswell silty clay, 2 to 8 percent slopes, severely eroded	13	IVe-2	64	5	80
BoD3	Boswell silty clay, 8 to 12 percent slopes, severely eroded	13	VIe-2	66	5	80
BpE2	Boswell soils, 12 to 25 percent slopes, eroded	14	VIIe-1	67	5	80
BrC	Brandon silt loam, 5 to 8 percent slopes	14	IIIe-1	62	2	75
BrD	Brandon silt loam, 8 to 12 percent slopes	14	IVe-1	64	2	75
Bu	Bruno loamy fine sand	15	IIs-1	62	4	79
CaA	Captina silt loam, 0 to 2 percent slopes	16	IIw-2	61	3	79
CaB2	Captina silt loam, 2 to 5 percent slopes, eroded	15	IIe-2	60	3	79
CbB3	Captina silty clay loam, 2 to 8 percent slopes, severely eroded	16	IVe-3	65	3	79
CcD	Colbert silty clay loam, 5 to 12 percent slopes	16	IVe-2	64	6	80
CcE	Colbert silty clay loam, 12 to 25 percent slopes	16	VIe-2	66	6	80
CdE	Colbert-Talbott very rocky clays, 8 to 25 percent slopes	17	VIIs-1	67	9	81
CeE	Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes	17	VIIs-1	67	9	81
Cf	Collins fine sandy loam	17	I-1	60	4	79
Cg	Collins loam, local alluvium	17	I-1	60	4	79
Ch	Collins silt loam	18	I-1	60	4	79
CkD	Culleoka silt loam, 5 to 12 percent slopes	18	IIIe-1	62	6	80
CkF	Culleoka silt loam, 12 to 35 percent slopes	18	VIe-1	66	6	80
CnE	Cuthbert fine sandy loam, 12 to 25 percent slopes	19	VIIe-1	67	5	80
CnF	Cuthbert fine sandy loam, 25 to 35 percent slopes	19	VIIe-1	67	5	80
CrF	Cuthbert-Ruston complex, 12 to 35 percent slopes	19	VIIe-1	67	5	80
CsD	Cuthbert and Susquehanna soils, 5 to 12 percent slopes	20	VIe-2	66	5	80
DaD	Dandridge-Needmore complex, 8 to 12 percent slopes	21	IVe-2	64	6	80
DaF	Dandridge-Needmore complex, 12 to 35 percent slopes	20	VIe-2	66	6	80
DcB3	Dexter clay loam, 2 to 5 percent slopes, severely eroded	22	IIIe-1	62	1	74
DcC3	Dexter clay loam, 5 to 8 percent slopes, severely eroded	22	IVe-1	64	1	74
DcD3	Dexter clay loam, 8 to 12 percent slopes, severely eroded	22	VIe-1	66	1	74
DeB2	Dexter loam, 2 to 5 percent slopes, eroded	21	IIe-1	60	1	74
DeC2	Dexter loam, 5 to 8 percent slopes, eroded	22	IIIe-1	62	1	74
DeD	Dexter loam, 8 to 12 percent slopes	22	IVe-1	64	1	74
DkB	Dulac silt loam, 2 to 5 percent slopes	22	IIe-2	60	3	79
DkB2	Dulac silt loam, 2 to 5 percent slopes, eroded	23	IIe-2	60	3	79
DkB3	Dulac silt loam, 2 to 5 percent slopes, severely eroded	23	IIIe-2	62	3	79
DkC	Dulac silt loam, 5 to 8 percent slopes	23	IIIe-2	62	3	79
DkC3	Dulac silt loam, 5 to 8 percent slopes, severely eroded	23	IVe-3	65	3	79
Du	Dunning silty clay loam	24	IIIw-2	64	8	81
Ea	Egam silty clay loam	24	IIw-2	61	4	79
Ec	Ennis cherty silt loam	25	IIs-1	62	4	79
Ee	Ennis cherty silt loam, local alluvium	26	IIs-1	62	4	79
Ef	Ennis fine sandy loam	26	I-1	60	4	79
Em	Ennis silt loam	25	I-1	60	4	79
En	Ennis silt loam, local alluvium	25	I-1	60	4	79
EtC3	Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded	26	IIIe-1	62	2	75
EtD3	Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded	26	IVe-1	64	2	75
Fa	Falaya loam, local alluvium	27	IIw-1	61	8	81
Fm	Falaya silt loam	27	IIw-1	61	8	81
FrB2	Freeland loam, 2 to 5 percent slopes, eroded	28	IIe-2	60	3	79
FrB3	Freeland loam, 2 to 5 percent slopes, severely eroded	28	IIIe-2	62	3	79
FrC2	Freeland loam, 5 to 8 percent slopes, eroded	28	IIIe-2	62	3	79
FrC3	Freeland loam, 5 to 8 percent slopes, severely eroded	28	IVe-3	65	3	79
Ga	Gravelly alluvial land	28	VIIs-1	67	9	81
Gc	Gullied land, clayey materials	29	VIIe-1	67	9	81
Gm	Gullied land, loamy materials	29	VIIe-1	67	9	81
Gs	Gullied land, sandy materials	29	VIIe-1	67	9	81
Ha	Hatchie loam	30	IIIw-1	63	7	81
HcB2	Humphreys cherty silt loam, 2 to 5 percent slopes, eroded	30	IIe-1	60	4	79
HmB2	Humphreys silt loam, 2 to 5 percent slopes, eroded	30	IIe-1	60	4	79
Hn	Huntington fine sandy loam	31	I-1	60	4	79
Hu	Huntington silt loam	31	I-1	60	4	79
LaD2	Landisburg cherty silt loam, 5 to 12 percent slopes, eroded	31	IVe-3	65	3	79
LaE	Landisburg cherty silt loam, 12 to 20 percent slopes	32	VIe-2	66	3	79
LcD3	Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded	32	VIe-2	66	3	79
Le	Lee cherty silt loam	33	IIIw-2	64	8	81
Lm	Lee silt loam	32	IIIw-2	64	8	81
Ln	Lindside silt loam	33	IIw-1	61	4	79

GUIDE TO MAPPING UNITS—Continued

Map symbol	*Soil*	*Page*	*Capability unit* *Symbol*	*Capability unit* *Page*	*Woodland group* *Number*	*Woodland group* *Page*
Ls	Lindside silty clay loam	33	IIw-1	61	4	79
Lt	Lobelville cherty silt loam	34	IIw-1	61	4	79
Lv	Lobelville silt loam	34	IIw-1	61	4	79
MaC	Magnolia fine sandy loam, 5 to 8 percent slopes	34	IIIe-1	62	5	80
MaD	Magnolia fine sandy loam, 8 to 12 percent slopes	35	IVe-1	64	5	80
MaE	Magnolia fine sandy laom, 12 to 25 percent slopes	35	VIe-1	66	5	80
Mc	Mantachie fine sandy loam	35	IIw-1	61	8	81
Me	Melvin and Newark silt loams	36	IIIw-2	64	8	81
MhD	Minvale cherty silt loam, 5 to 12 percent slopes	37	IIIe-1	62	2	75
MhE	Minvale cherty silt loam, 12 to 25 percent slopes	37	VIe-1	66	2	75
MnD3	Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded	37	IVe-1	64	2	75
MnE3	Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded	37	VIe-1	66	2	75
MoC	Mountview silt loam, 5 to 8 percent slopes	37	IIIe-1	62	2	75
PaB	Paden silt loam, 2 to 5 percent slopes	38	IIe-2	60	3	79
PaB2	Paden silt loam, 2 to 5 percent slopes, eroded	39	IIe-2	60	3	79
PaB3	Paden silt loam, 2 to 5 percent slopes, severely eroded	39	IIIe-2	62	3	79
PaC	Paden silt loam, 5 to 8 percent slopes	39	IIIe-2	62	3	79
PaC2	Paden silt loam, 5 to 8 percent slopes, eroded	39	IIIe-2	62	3	79
PaC3	Paden silt loam, 5 to 8 percent slopes, severely eroded	39	IVe-3	65	3	79
Pc	Paden-gullied land complex	40	VIe-2	66	3	79
PkB	Pickwick silt loam, 2 to 5 percent slopes	40	IIe-1	60	1	74
PkB2	Pickwick silt loam, 2 to 5 percent slopes, eroded	41	IIe-1	60	1	74
PkC	Pickwick silt loam, 5 to 8 percent slopes	41	IIIe-1	62	1	74
PkC2	Pickwick silt loam, 5 to 8 percent slopes, eroded	41	IIIe-1	62	1	74
PkD	Pickwick silt loam, 8 to 12 percent slopes	41	IVe-1	64	1	74
PkE	Pickwick silt loam, 12 to 25 percent slopes	41	VIe-1	66	1	74
PwB3	Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded	41	IIIe-1	62	1	74
PwC3	Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded	42	IIIe-1	62	1	74
PwD3	Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded	42	IVe-1	64	1	74
PwE3	Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded	42	VIe-1	66	1	74
Px	Pickwick-gullied land complex	42	VIe-1	66	1	74
Rb	Robertsville silt loam	42	IVw-1	65	7	81
Rc	Rock land	43	VIIs-1	67	9	81
RfC	Ruston fine sandy loam, 5 to 8 percent slopes	43	IIIe-1	62	5	80
RfD	Ruston fine sandy loam, 8 to 12 percent slopes	44	IVe-1	64	5	80
RfE	Ruston fine sandy loam, 12 to 25 percent slopes	44	VIe-1	66	5	80
RfF	Ruston fine sandy loam, 25 to 45 percent slopes	44	VIIe-1	67	5	80
RuD3	Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded	44	VIe-1	66	5	80
RuE3	Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded	44	VIIe-1	67	5	80
SaD	Saffell gravelly sandy loam, 5 to 12 percent slopes	45	IVs-1	66	9	81
SaE	Saffell gravelly sandy loam, 12 to 20 percent slopes	45	VIIe-1	67	9	81
ScA	Sequatchie fine sandy loam, 0 to 2 percent slopes	45	I-1	60	4	79
ScB2	Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded	45	IIe-1	60	4	79
SeC3	Sequatchie loam, 2 to 8 percent slopes, severely eroded	46	IIIe-1	62	4	79
ShC3	Shubuta clay loam, 5 to 8 percent slopes, severely eroded	47	IVe-2	64	5	80
ShD3	Shubuta clay loam, 8 to 12 percent slopes, severely eroded	47	VIe-2	66	5	80
ShE3	Shubuta clay loam, 12 to 25 percent slopes, severely eroded	47	VIIe-1	67	5	80
SmC	Shubuta fine sandy loam, 5 to 8 percent slopes	46	IIIe-3	63	5	80
SmC2	Shubuta fine sandy loam, 5 to 8 percent slopes, eroded	46	IIIe-3	63	5	80
SmD	Shubuta fine sandy loam, 8 to 12 percent slopes	47	IVe-2	64	5	80
SmE	Shubuta fine sandy loam, 12 to 25 percent slopes	47	VIe-2	66	5	80
SmF	Shubuta fine sandy loam, 25 to 45 percent slopes	47	VIIe-1	67	5	80
Sp	Shubuta-gullied land complex	47	VIIe-1	67	5	80
SrB	Silerton silt loam, 2 to 5 percent slopes	48	IIe-1	60	1	74
SrB2	Silerton silt loam, 2 to 5 percent slopes, eroded	48	IIe-1	60	1	74
SrC	Silerton silt loam, 5 to 8 percent slopes	48	IIIe-1	62	1	74
SrC2	Silerton silt loam, 5 to 8 percent slopes, eroded	48	IIIe-1	62	1	74
SrD	Silerton silt loam, 8 to 12 percent slopes	49	IVe-1	64	1	74
SsB3	Silerton silty clay loam, 2 to 5 percent slopes, severely eroded	49	IIIe-1	62	1	74
SsC3	Silerton silty clay loam, 5 to 8 percent slopes, severely eroded	49	IVe-1	64	1	74
SsD3	Silerton silty clay loam, 8 to 12 percent slopes, severely eroded	49	VIe-1	66	1	74
SuD2	Sumter silty clay, 5 to 12 percent slopes, eroded	49	VIe-2	66	6	80
SuF2	Sumter silty clay, 12 to 35 percent slopes, eroded	50	VIe-2	66	6	80
Sw	Swamp	50	----	----	8	81
Ta	Taft silt loam	50	IIIw-1	63	7	81
TbD	Talbott cherty silt loam, 5 to 12 percent slopes	52	IVe-2	64	6	80
TbE	Talbott cherty silt loam, 12 to 25 percent slopes	52	VIe-2	66	6	80
TbF	Talbott cherty silt loam, 25 to 35 percent slopes	52	VIIe-1	67	6	80
TcD3	Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded	52	VIe-2	66	6	80
TcE3	Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded	52	VIe-2	66	6	80
TsB	Talbott silt loam, 2 to 5 percent slopes	51	IIIe-3	63	6	80
TsC	Talbott silt loam, 5 to 8 percent slopes	51	IIIe-3	63	6	80
TsD	Talbott silt loam, 8 to 12 percent slopes	51	IVe-2	64	6	80
TsE	Talbott silt loam, 12 to 25 percent slopes	51	VIe-2	66	6	80
TtC3	Talbott silty clay, 5 to 8 percent slopes, severely eroded	51	VIe-2	66	6	80

GUIDE TO MAPPING UNITS—Continued

Map symbol	Soil	Page	Capability unit Symbol	Capability unit Page	Woodland group Number	Woodland group Page
TtE3	Talbott silty clay, 8 to 25 percent slopes, severely eroded	52	VIe-2	66	6	80
Vb	Vicksburg loam	53	I-1	60	4	79
Vc	Vicksburg loam, local alluvium	53	I-1	60	4	79
Wa	Waverly fine sandy loam	54	IIIw-2	64	8	81
Wb	Waverly silt loam	53	IIIw-2	64	8	81
WcB3	Waynesboro clay loam, 2 to 5 percent slopes, severely eroded	55	IIIe-1	62	1	74
WcC3	Waynesboro clay loam, 5 to 8 percent slopes, severely eroded	55	IVe-1	64	1	74
WcD3	Waynesboro clay loam, 8 to 12 percent slopes, severely eroded	55	IVe-1	64	1	74
WcF3	Waynesboro clay loam, 12 to 35 percent slopes, severely eroded	55	VIe-1	66	1	74
WfB	Waynesboro fine sandy loam, 2 to 5 percent slopes	54	IIe-1	60	1	74
WfC	Waynesboro fine sandy loam, 5 to 8 percent slopes	54	IIIe-1	62	1	74
WfD	Waynesboro fine sandy loam, 8 to 12 percent slopes	55	IVe-1	64	1	74
WfF	Waynesboro fine sandy loam, 12 to 35 percent slopes	55	VIe-1	66	1	74
WgD3	Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded	56	IVe-1	64	2	75
WgE3	Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded	56	VIe-1	66	2	75
WmC	Waynesboro gravelly sandy loam, 5 to 8 percent slopes	56	IIIe-1	62	2	75
WmD	Waynesboro gravelly sandy loam, 8 to 12 percent slopes	56	IIIe-1	62	2	75
WmE	Waynesboro gravelly sandy loam, 12 to 25 percent slopes	56	VIe-1	66	2	75
WnD	Waynesboro very gravelly sandy loam, 5 to 12 percent slopes	57	IVs-1	66	9	81
WnE	Waynesboro very gravelly sandy loam, 12 to 25 percent slopes	57	VIIs-1	67	9	81
WnF	Waynesboro very gravelly sandy loam, 25 to 45 percent slopes	57	VIIs-1	67	9	81
WoA	Wolftever silt loam, 0 to 2 percent slopes	58	IIw-2	61	3	79
WoB	Wolftever silt loam, 2 to 5 percent slopes	57	IIe-2	60	3	79
WoB2	Wolftever silt loam, 2 to 5 percent slopes, eroded	58	IIe-2	60	3	79
WvB3	Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded	58	IIIe-2	62	3	79
WvC3	Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded	58	IVe-3	65	3	79

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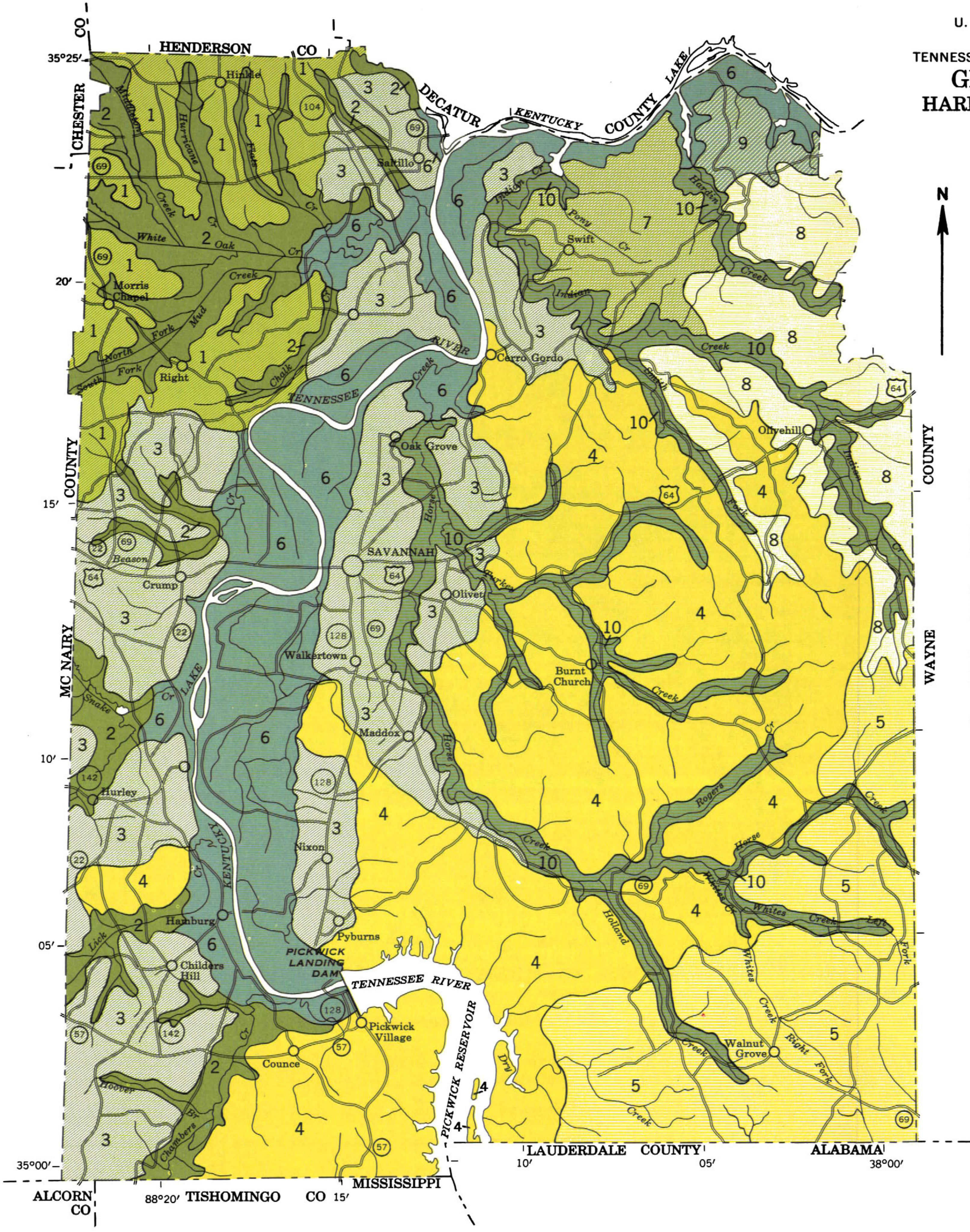
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TENNESSEE AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
HARDIN COUNTY, TENNESSEE

1 0 1 2 3 4 Miles

Scale 1:186,353

N



SOIL ASSOCIATIONS

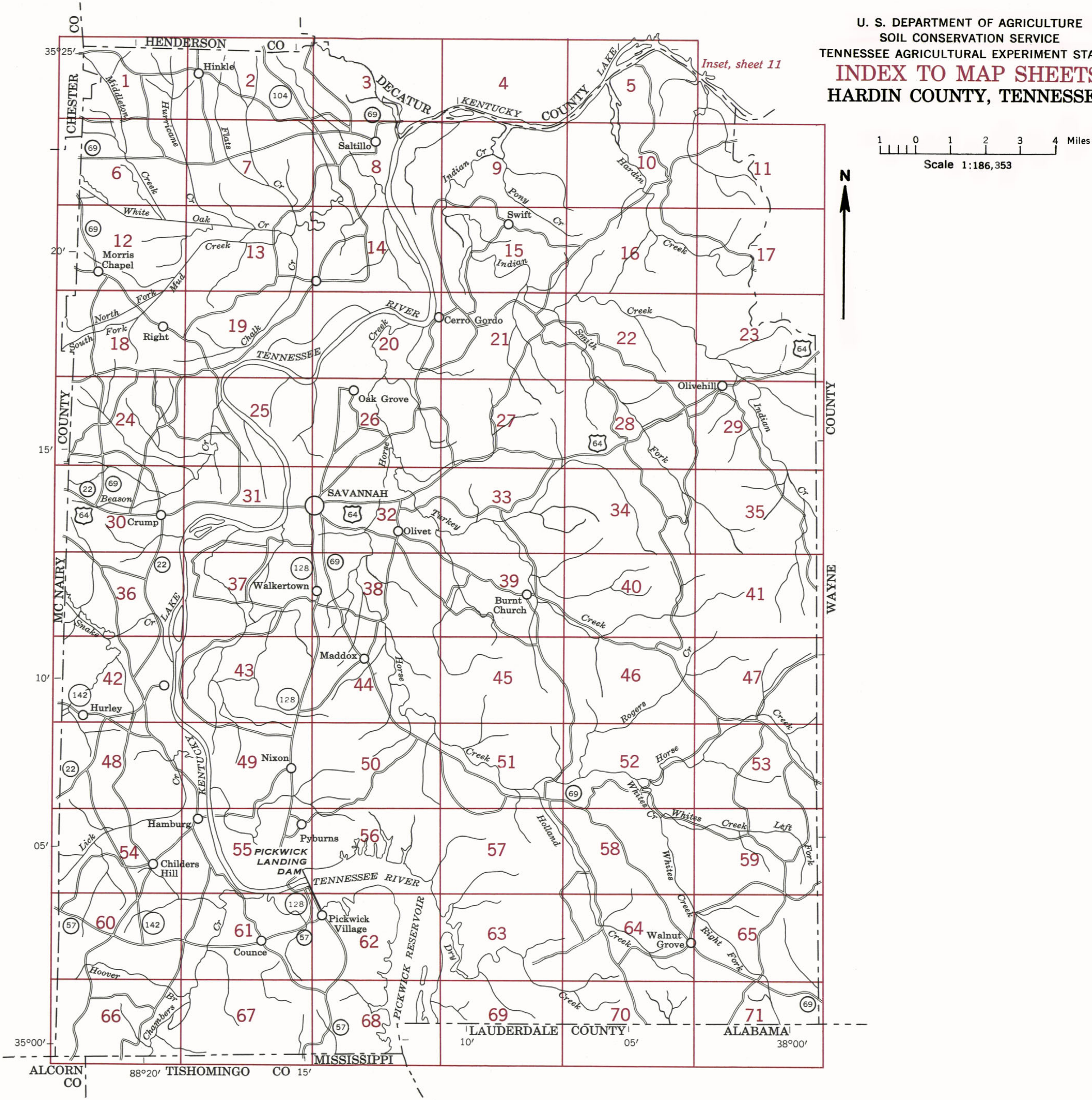
1	Shubuta-Boswell association: Rolling to hilly, well-drained soils in coastal plain sediments.
2	Waverly-Falaya-Freeland association: Nearly level, poorly drained and somewhat poorly drained, silty or sandy soils on flood plains and low terraces.
3	Paden-Pickwick-Waynesboro association: Moderately well drained soils and well drained soils on high terraces.
4	Shubuta-Waynesboro-Bodine association: Well-drained to excessively drained soils on hilly and steep uplands and terraces.
5	Shubuta-Silerton-Dulac association: Well drained and moderately well drained soils on silt-capped, hilly uplands.
6	Wolftever-Beason-Egam association: Nearly level soils on low stream terraces and flood plains of the Tennessee River.
7	Pickwick-Talbott-Waynesboro association: Well-drained soils of broad, irregular, mainly rolling, low hills and terraces.
8	Bodine-Talbott-Culleoka association: Shallow soils on steep uplands.
9	Talbott-Pickwick association: Fine-textured soils over limestone on rolling to hilly uplands.
10	Ennis-Lobelville-Humphreys association: Nearly level, silty, cherty soils on flood plains and low terraces along small streams.

April 1962

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TENNESSEE AGRICULTURAL EXPERIMENT STATION

INDEX TO MAP SHEETS

HARDIN COUNTY, TENNESSEE



SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Most symbols without a slope letter are those of nearly level soils; a few designate soils or land types that have a considerable range of slope. A final number, 2 or 3, in the symbol, shows that the soil is eroded or severely eroded.

SYMBOL	NAME
Am	Almo silt loam
Ba	Beason silt loam
BdD	Bodine cherty silt loam, 5 to 12 percent slopes
BdF	Bodine cherty silt loam, 12 to 35 percent slopes
BeF	Bodine-Guin complex, 20 to 35 percent slopes
BfC	Boswell fine sandy loam, 2 to 8 percent slopes
BfD	Boswell fine sandy loam, 8 to 12 percent slopes
BoC3	Boswell silty clay, 2 to 8 percent slopes, severely eroded
BoD3	Boswell silty clay, 8 to 12 percent slopes, severely eroded
BpE2	Boswell soils, 12 to 25 percent slopes, eroded
BrC	Brandon silt loam, 5 to 8 percent slopes
BrD	Brandon silt loam, 8 to 12 percent slopes
Bu	Bruno loamy fine sand
CaA	Captina silt loam, 0 to 2 percent slopes
CaB2	Captina silt loam, 2 to 5 percent slopes, eroded
CbB3	Captina silty clay loam, 2 to 8 percent slopes, severely eroded
CcD	Colbert silty clay loam, 5 to 12 percent slopes
CcE	Colbert silty clay loam, 12 to 25 percent slopes
CdE	Colbert-Talbott very rocky clays, 8 to 25 percent slopes
CeE	Colbert-Talbott very rocky silty clay loams, 8 to 25 percent slopes
Cf	Collins fine sandy loam
Cg	Collins loam, local alluvium
Ch	Collins silt loam
CkD	Culleoka silt loam, 5 to 12 percent slopes
CkF	Culleoka silt loam, 12 to 35 percent slopes
CnE	Cuthbert fine sandy loam, 12 to 25 percent slopes
CnF	Cuthbert fine sandy loam, 25 to 35 percent slopes
CrF	Cuthbert-Ruston complex, 12 to 35 percent slopes
CsD	Cuthbert and Susquehanna soils, 5 to 12 percent slopes
DaD	Dandridge-Needmore complex, 8 to 12 percent slopes
DaF	Dandridge-Needmore complex, 12 to 35 percent slopes
DcB3	Dexter clay loam, 2 to 5 percent slopes, severely eroded
DcC3	Dexter clay loam, 5 to 8 percent slopes, severely eroded
DcD3	Dexter clay loam, 8 to 12 percent slopes, severely eroded
DeB2	Dexter loam, 2 to 5 percent slopes, eroded
DeC2	Dexter loam, 5 to 8 percent slopes, eroded
DeD	Dexter loam, 8 to 12 percent slopes
DkB	Dulac silt loam, 2 to 5 percent slopes
DkB2	Dulac silt loam, 2 to 5 percent slopes, eroded
DkB3	Dulac silt loam, 2 to 5 percent slopes, severely eroded
DkC	Dulac silt loam, 5 to 8 percent slopes
DkC3	Dulac silt loam, 5 to 8 percent slopes, severely eroded
Du	Dunning silty clay loam
Ea	Egam silty clay loam
Ec	Ennis cherty silt loam
Ee	Ennis cherty silt loam, local alluvium
Ef	Ennis fine sandy loam
Em	Ennis silt loam
En	Ennis silt loam, local alluvium
EtC3	Etowah gravelly silty clay loam, 5 to 8 percent slopes, severely eroded
EtD3	Etowah gravelly silty clay loam, 8 to 12 percent slopes, severely eroded
Fa	Falaya loam, local alluvium
Fm	Falaya silt loam
FrB2	Freeland loam, 2 to 5 percent slopes, eroded
FrB3	Freeland loam, 2 to 5 percent slopes, severely eroded
FrC2	Freeland loam, 5 to 8 percent slopes, eroded
FrC3	Freeland loam, 5 to 8 percent slopes, severely eroded

SYMBOL	NAME
Ga	Gravelly alluvial land
Gc	Gullied land, clayey materials
Gm	Gullied land, loamy materials
Gs	Gullied land, sandy materials
Ha	Hatchie loam
HcB2	Humphreys cherty silt loam, 2 to 5 percent slopes, eroded
HmB2	Humphreys silt loam, 2 to 5 percent slopes, eroded
Hn	Huntington fine sandy loam
Hu	Huntington silt loam
LaD2	Landisburg cherty silt loam, 5 to 12 percent slopes, eroded
LaE	Landisburg cherty silt loam, 12 to 20 percent slopes
LcD3	Landisburg cherty silty clay loam, 5 to 12 percent slopes, severely eroded
Le	Lee cherty silt loam
Lm	Lee silt loam
Ln	Lindside silt loam
Ls	Lindside silty clay loam
Lt	Lobelville cherty silt loam
Lv	Lobelville silt loam
MaC	Magnolia fine sandy loam, 5 to 8 percent slopes
MaD	Magnolia fine sandy loam, 8 to 12 percent slopes
MaE	Magnolia fine sandy loam, 12 to 25 percent slopes
Mc	Mantachie fine sandy loam
Me	Melvin and Newark silt loams
MhD	Minvale cherty silt loam, 5 to 12 percent slopes
MhE	Minvale cherty silt loam, 12 to 25 percent slopes
MnD3	Minvale cherty silty clay loam, 5 to 12 percent slopes, severely eroded
MnE3	Minvale cherty silty clay loam, 12 to 25 percent slopes, severely eroded
MoC	Mountview silt loam, 5 to 8 percent slopes
PaB	Paden silt loam, 2 to 5 percent slopes
PaB2	Paden silt loam, 2 to 5 percent slopes, eroded
PaB3	Paden silt loam, 2 to 5 percent slopes, severely eroded
PaC	Paden silt loam, 5 to 8 percent slopes
PaC2	Paden silt loam, 5 to 8 percent slopes, eroded
PaC3	Paden silt loam, 5 to 8 percent slopes, severely eroded
Pc	Paden - gullied land complex
PkB	Pickwick silt loam, 2 to 5 percent slopes
PkB2	Pickwick silt loam, 2 to 5 percent slopes, eroded
PkC	Pickwick silt loam, 5 to 8 percent slopes
PkC2	Pickwick silt loam, 5 to 8 percent slopes, eroded
PkD	Pickwick silt loam, 8 to 12 percent slopes
PkE	Pickwick silt loam, 12 to 25 percent slopes
PwB3	Pickwick silty clay loam, 2 to 5 percent slopes, severely eroded
PwC3	Pickwick silty clay loam, 5 to 8 percent slopes, severely eroded
PwD3	Pickwick silty clay loam, 8 to 12 percent slopes, severely eroded
PwE3	Pickwick silty clay loam, 12 to 25 percent slopes, severely eroded
Px	Pickwick - gullied land complex
Rb	Robertsville silt loam
Rc	Rock land
RfC	Ruston fine sandy loam, 5 to 8 percent slopes
RfD	Ruston fine sandy loam, 8 to 12 percent slopes
RfE	Ruston fine sandy loam, 12 to 25 percent slopes
RfF	Ruston fine sandy loam, 25 to 45 percent slopes
RuD3	Ruston sandy clay loam, 8 to 12 percent slopes, severely eroded
RuE3	Ruston sandy clay loam, 12 to 25 percent slopes, severely eroded
SaD	Saffell gravelly sandy loam, 5 to 12 percent slopes
SaE	Saffell gravelly sandy loam, 12 to 20 percent slopes
ScA	Sequatchie fine sandy loam, 0 to 2 percent slopes

SYMBOL	NAME
ScB2	Sequatchie fine sandy loam, 2 to 5 percent slopes, eroded
SeC3	Sequatchie loam, 2 to 8 percent slopes, severely eroded
ShC3	Shubuta clay loam, 5 to 8 percent slopes, severely eroded
ShD3	Shubuta clay loam, 8 to 12 percent slopes, severely eroded
ShE3	Shubuta clay loam, 12 to 25 percent slopes, severely eroded
SmC	Shubuta fine sandy loam, 5 to 8 percent slopes
SmC2	Shubuta fine sandy loam, 5 to 8 percent slopes, eroded
SmD	Shubuta fine sandy loam, 8 to 12 percent slopes
SmE	Shubuta fine sandy loam, 12 to 25 percent slopes
SmF	Shubuta fine sandy loam, 25 to 45 percent slopes
Sp	Shubuta - gullied land complex
SrB	Silerton silt loam, 2 to 5 percent slopes
SrB2	Silerton silt loam, 2 to 5 percent slopes, eroded
SrC	Silerton silt loam, 5 to 8 percent slopes
SrC2	Silerton silt loam, 5 to 8 percent slopes, eroded
SrD	Silerton silt loam, 8 to 12 percent slopes
SsB3	Silerton silty clay loam, 2 to 5 percent slopes, severely eroded
SsC3	Silerton silty clay loam, 5 to 8 percent slopes, severely eroded
SsD3	Silerton silty clay loam, 8 to 12 percent slopes, severely eroded
SuD2	Sumter silty clay, 5 to 12 percent slopes, eroded
SuF2	Sumter silty clay, 12 to 35 percent slopes, eroded
Sw	Swamp
Ta	Taft silt loam
TbD	Talbott cherty silt loam, 5 to 12 percent slopes
TbE	Talbott cherty silt loam, 12 to 25 percent slopes
TbF	Talbott cherty silt loam, 25 to 35 percent slopes
TcD3	Talbott cherty silty clay, 5 to 12 percent slopes, severely eroded
TcE3	Talbott cherty silty clay, 12 to 25 percent slopes, severely eroded
TsB	Talbott silt loam, 2 to 5 percent slopes
TsC	Talbott silt loam, 5 to 8 percent slopes
TsD	Talbott silt loam, 8 to 12 percent slopes
TsE	Talbott silt loam, 12 to 25 percent slopes
TtC3	Talbott silty clay, 5 to 8 percent slopes, severely eroded
TtE3	Talbott silty clay, 8 to 25 percent slopes, severely eroded
Vb	Vicksburg loam
Vc	Vicksburg loam, local alluvium
Wa	Waverly fine sandy loam
Wb	Waverly silt loam
WcB3	Waynesboro clay loam, 2 to 5 percent slopes, severely eroded
WcC3	Waynesboro clay loam, 5 to 8 percent slopes, severely eroded
WcD3	Waynesboro clay loam, 8 to 12 percent slopes, severely eroded
WcF3	Waynesboro clay loam, 12 to 35 percent slopes, severely eroded
WfB	Waynesboro fine sandy loam, 2 to 5 percent slopes
WfC	Waynesboro fine sandy loam, 5 to 8 percent slopes
WfD	Waynesboro fine sandy loam, 8 to 12 percent slopes
WfF	Waynesboro fine sandy loam, 12 to 35 percent slopes
WgD3	Waynesboro gravelly clay loam, 5 to 12 percent slopes, severely eroded
WgE3	Waynesboro gravelly clay loam, 12 to 25 percent slopes, severely eroded
WmC	Waynesboro gravelly sandy loam, 5 to 8 percent slopes
WmD	Waynesboro gravelly sandy loam, 8 to 12 percent slopes
WmE	Waynesboro gravelly sandy loam, 12 to 25 percent slopes
WnD	Waynesboro very gravelly sandy loam, 5 to 12 percent slopes
WnE	Waynesboro very gravelly sandy loam, 12 to 25 percent slopes
WnF	Waynesboro very gravelly sandy loam, 25 to 45 percent slopes
WoA	Wolftever silt loam, 0 to 2 percent slopes
WoB	Wolftever silt loam, 2 to 5 percent slopes
WoB2	Wolftever silt loam, 2 to 5 percent slopes, eroded
WvB3	Wolftever silty clay loam, 2 to 5 percent slopes, severely eroded
WvC3	Wolftever silty clay loam, 5 to 10 percent slopes, severely eroded

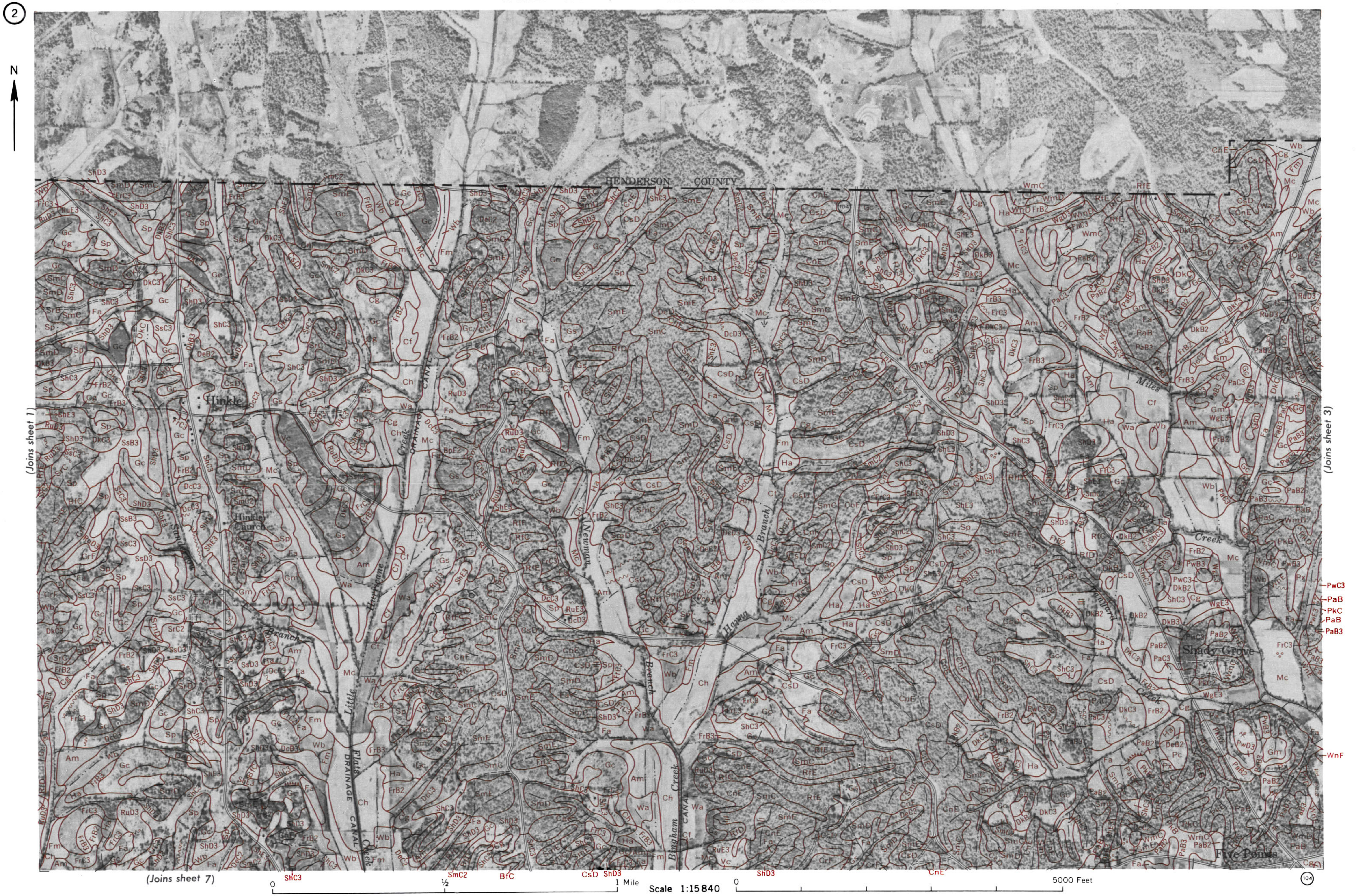
Soil map constructed 1962 by Cartographic Division, Soil Conservation Service, USDA, from 1955 aerial photographs. Controlled mosaic based on Tennessee plane coordinate system, west zone, Lambert conformal conic projection, 1927 North American datum.

1

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 2

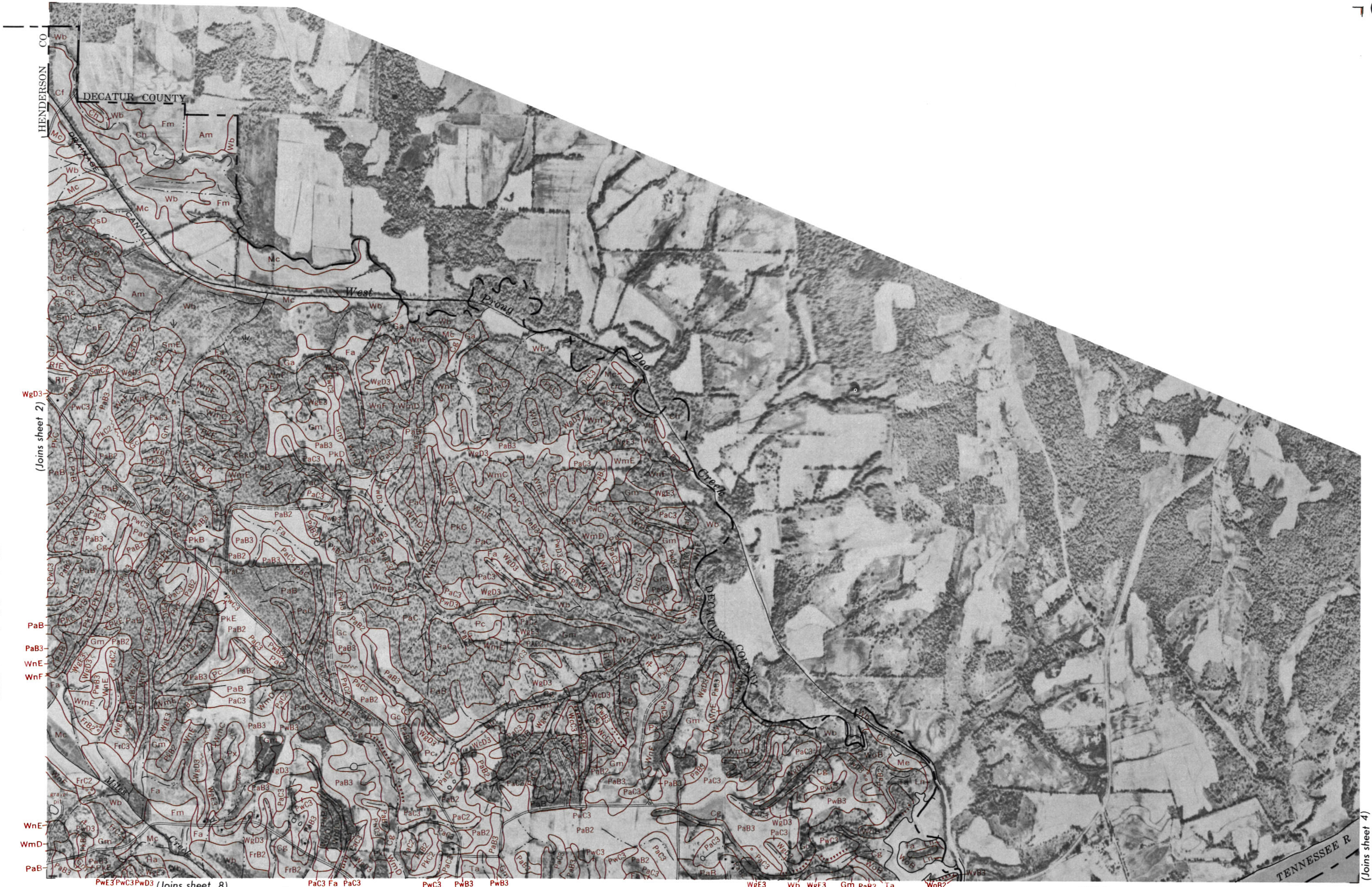


0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

3

N

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

4

N

(Joins sheet 3)

(Joins sheet 9)

(Joins sheet 5)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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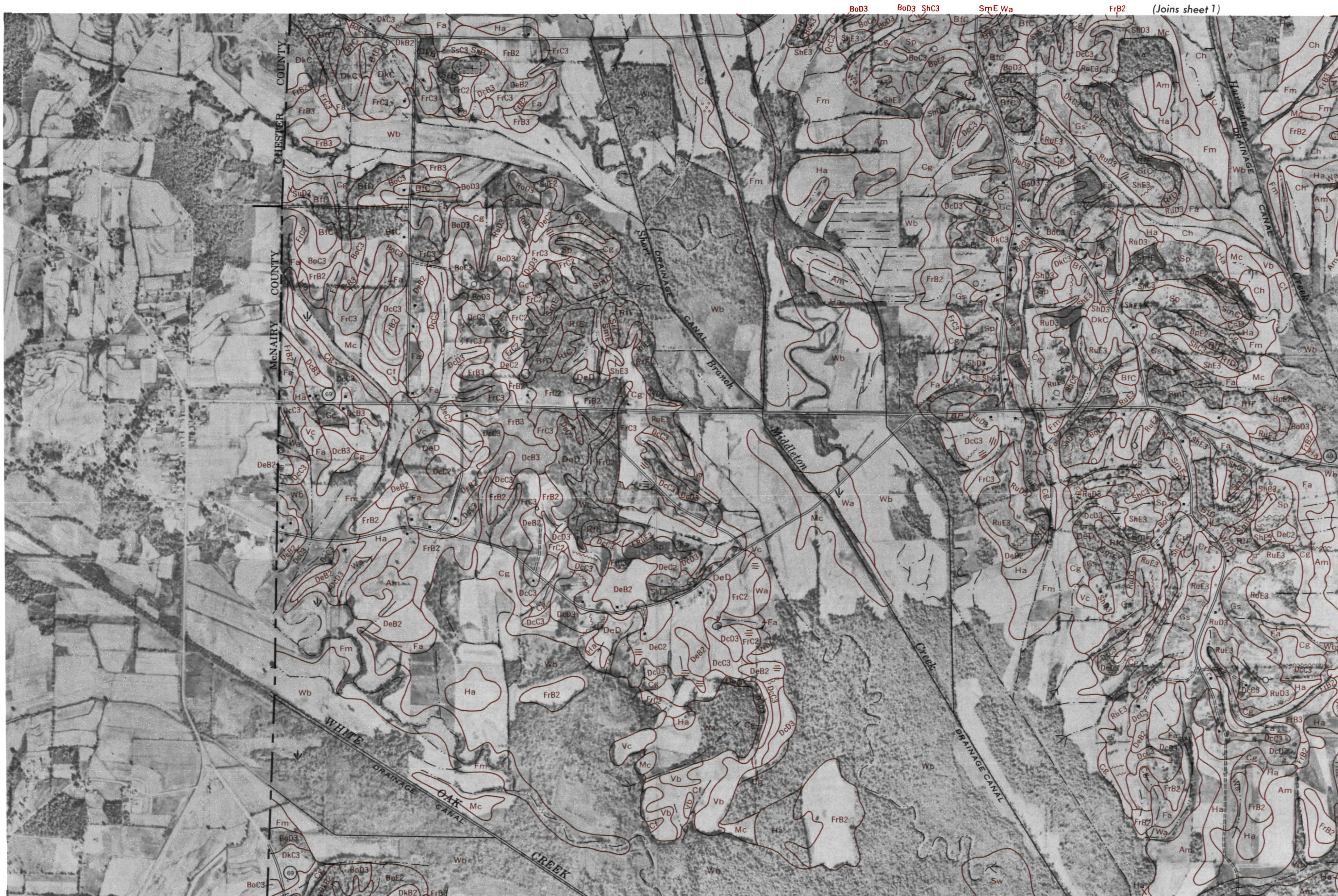
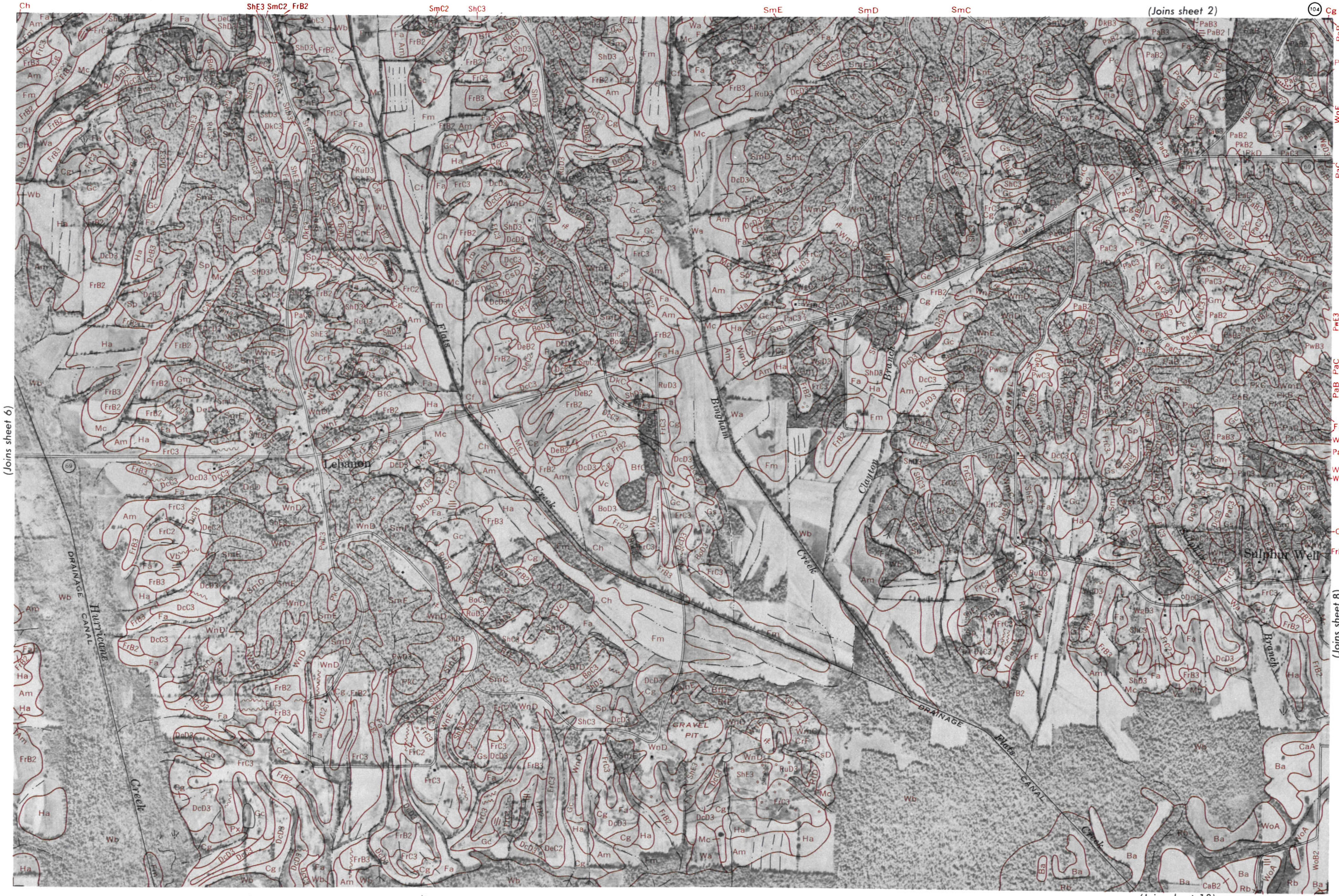
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 6



0 ½ 1 Mile Scale 1:15840 0 5000 Feet

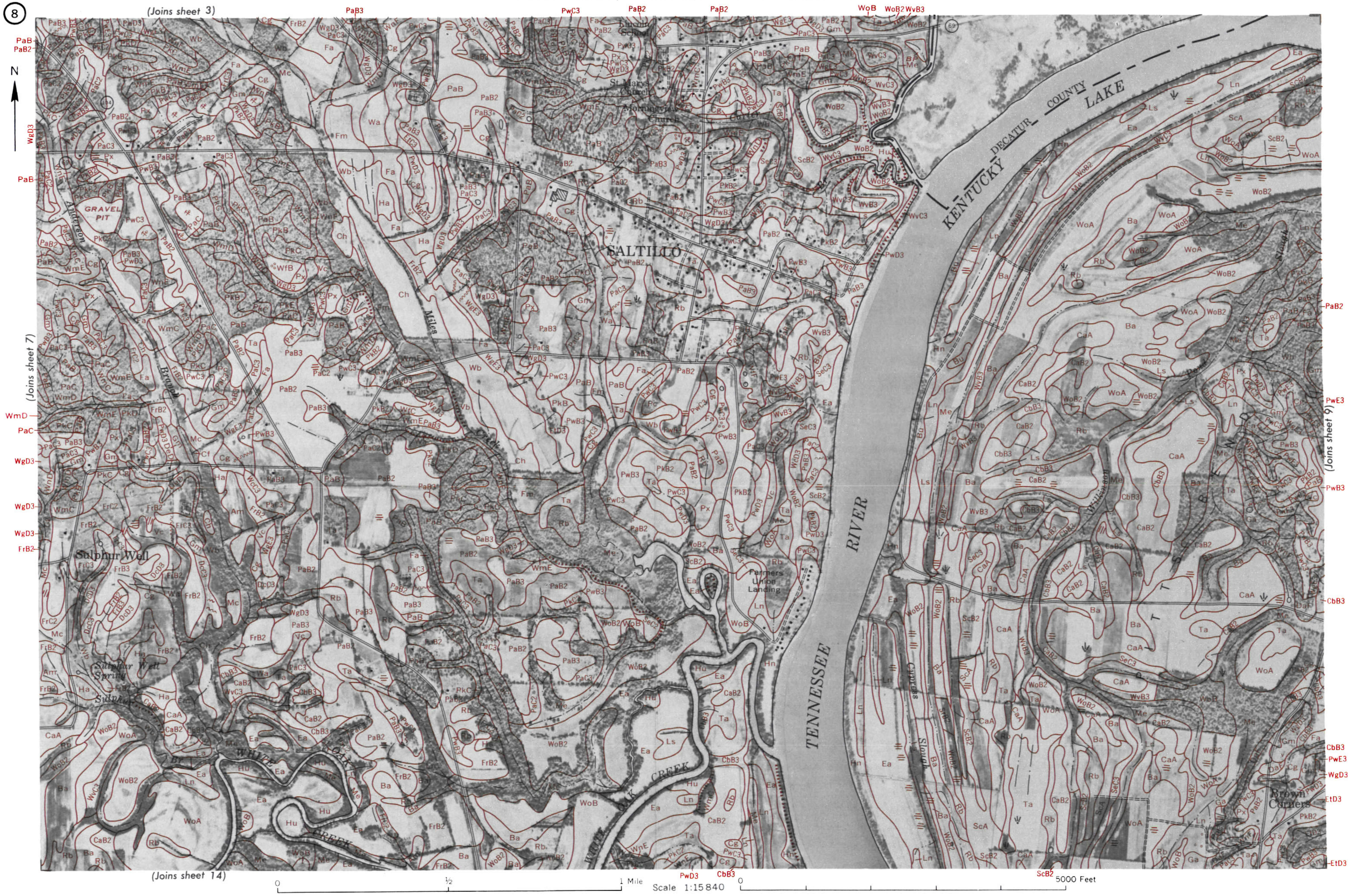
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 7



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

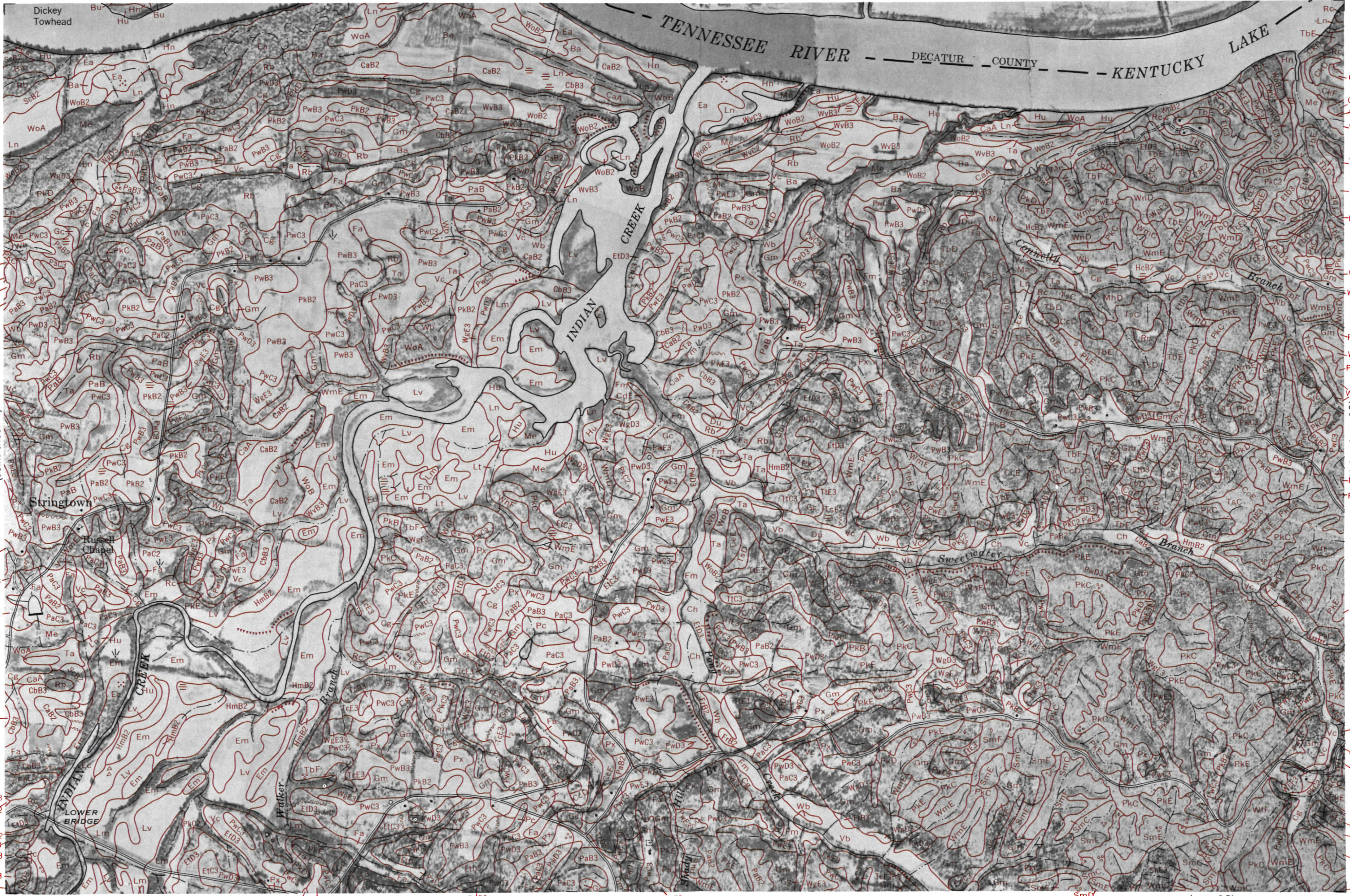
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 8



HARDIN COUNTY, TENNESSEE — SHEET NUMBER 9

9

(Joins sheet 4)



(Joins sheet 8)

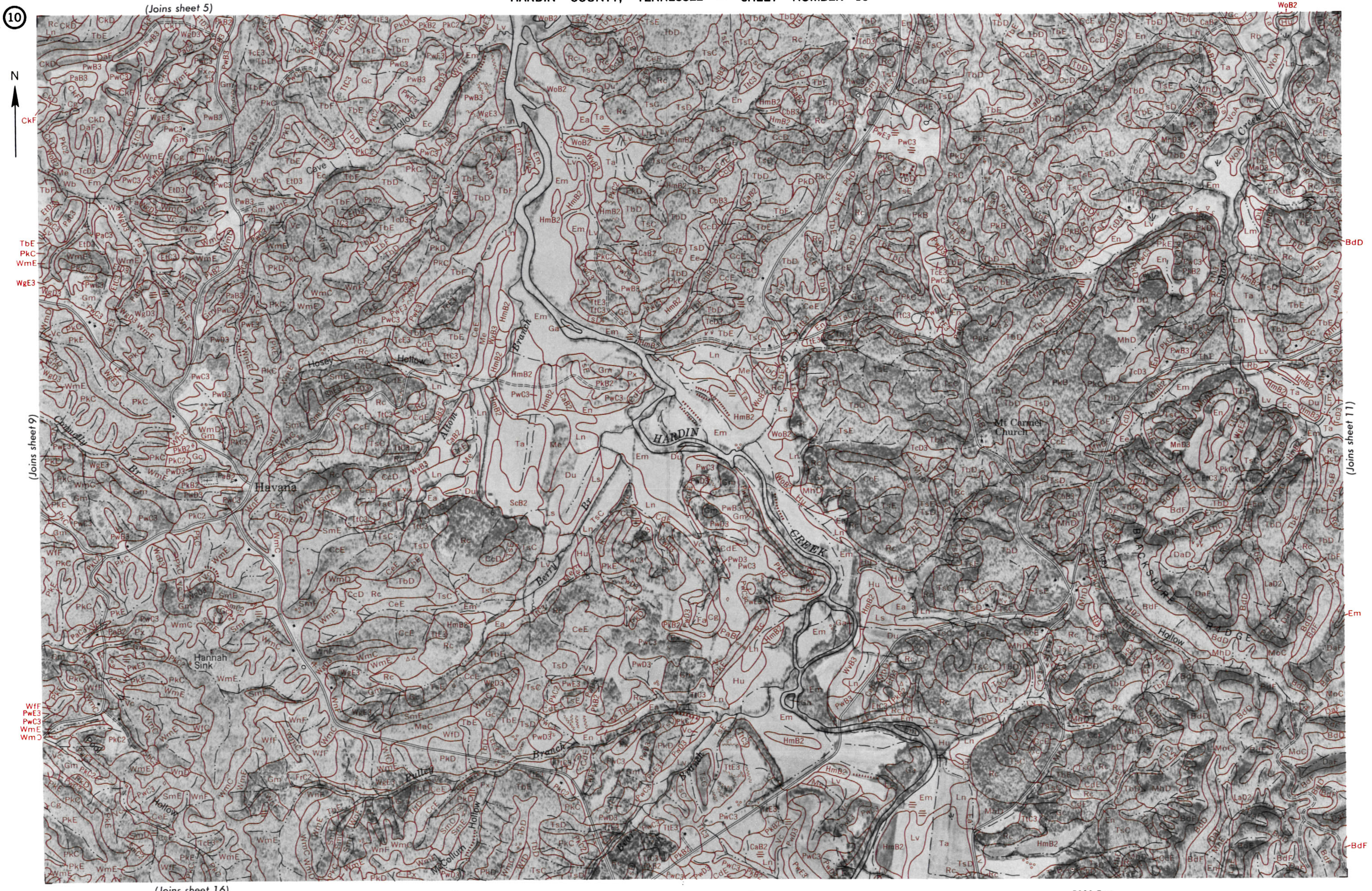
(Joins sheet 10)

(Joins sheet 15)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 10



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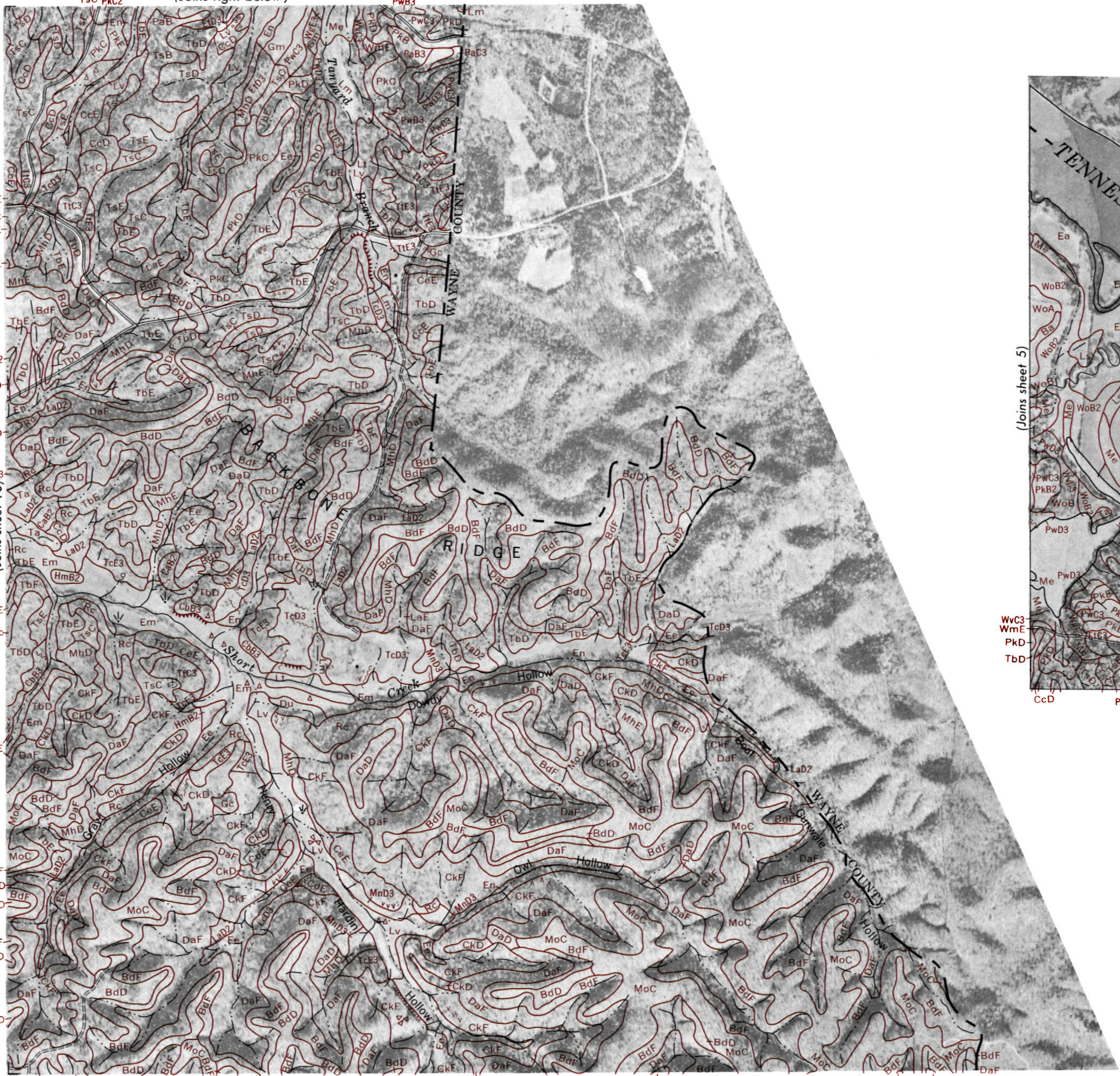
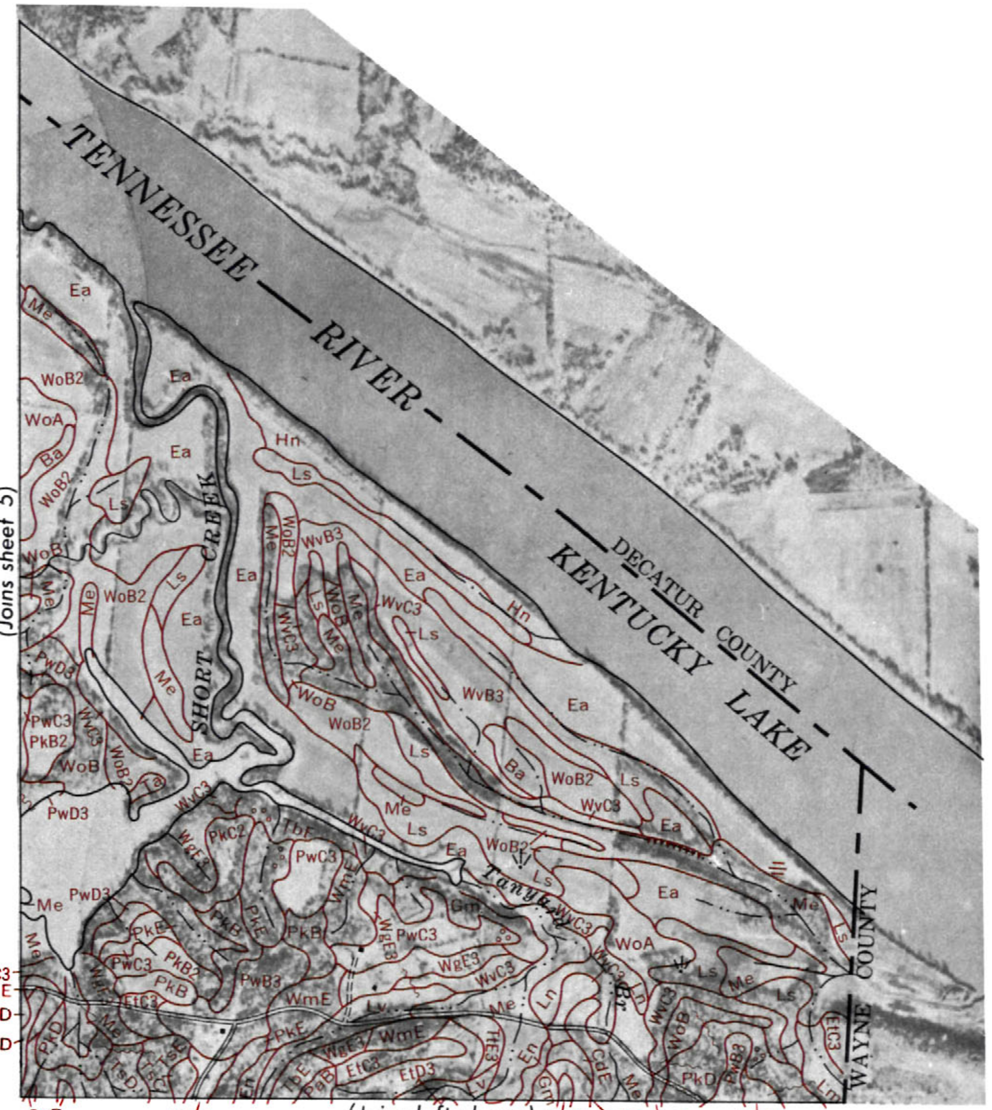
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 11

11





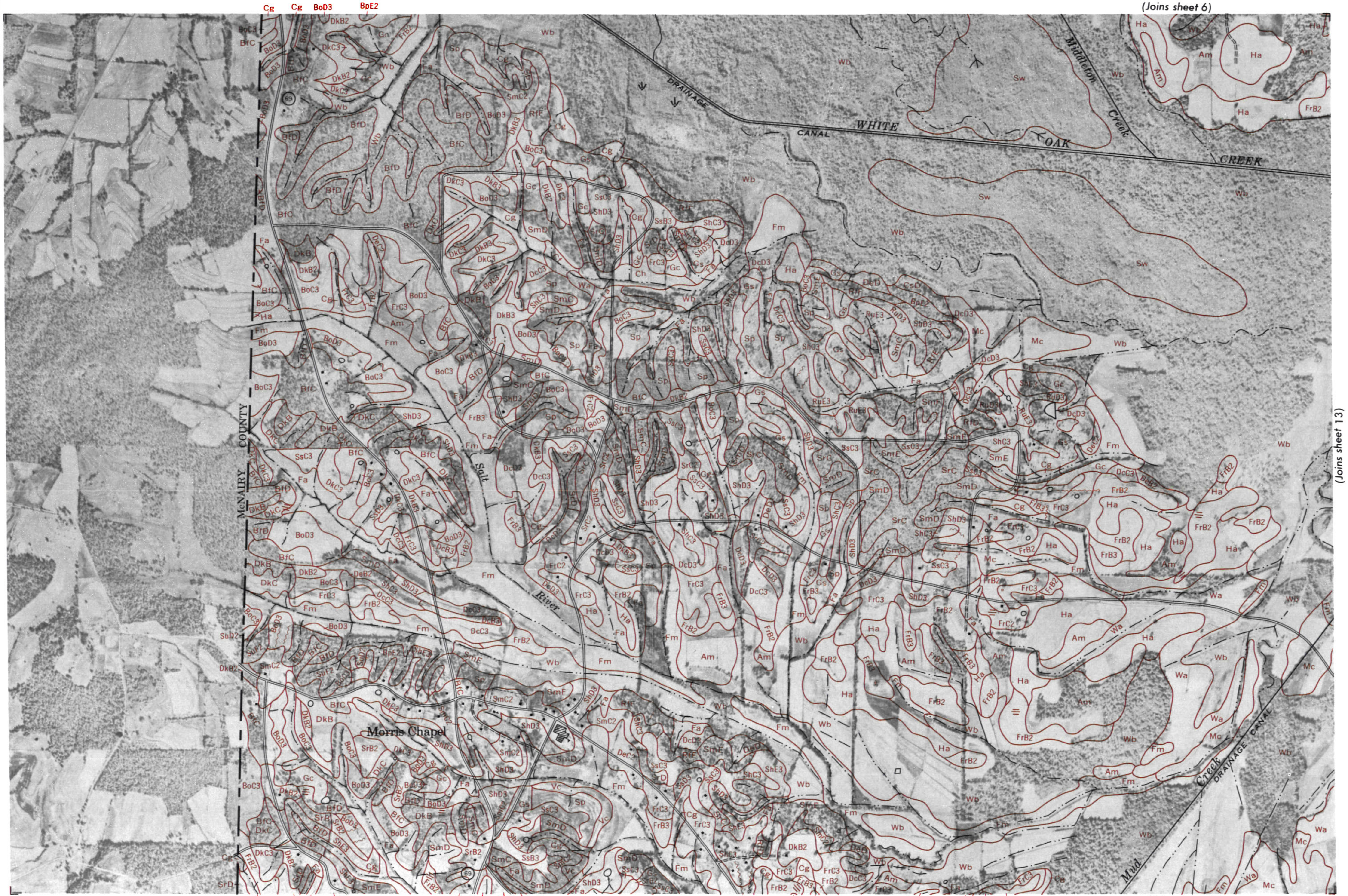
Scale 1:15 840

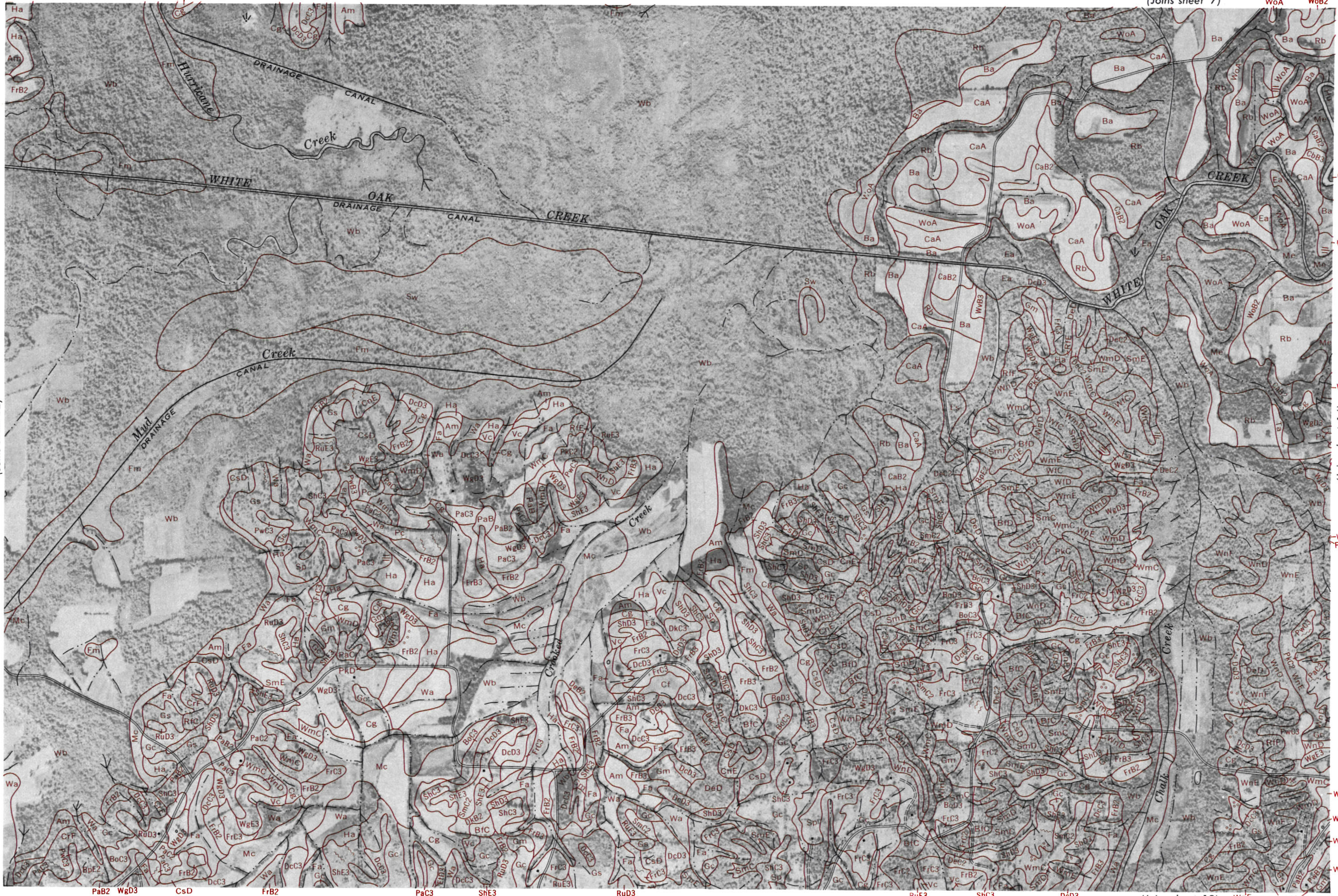
0 ½ 1 Mile

0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 12





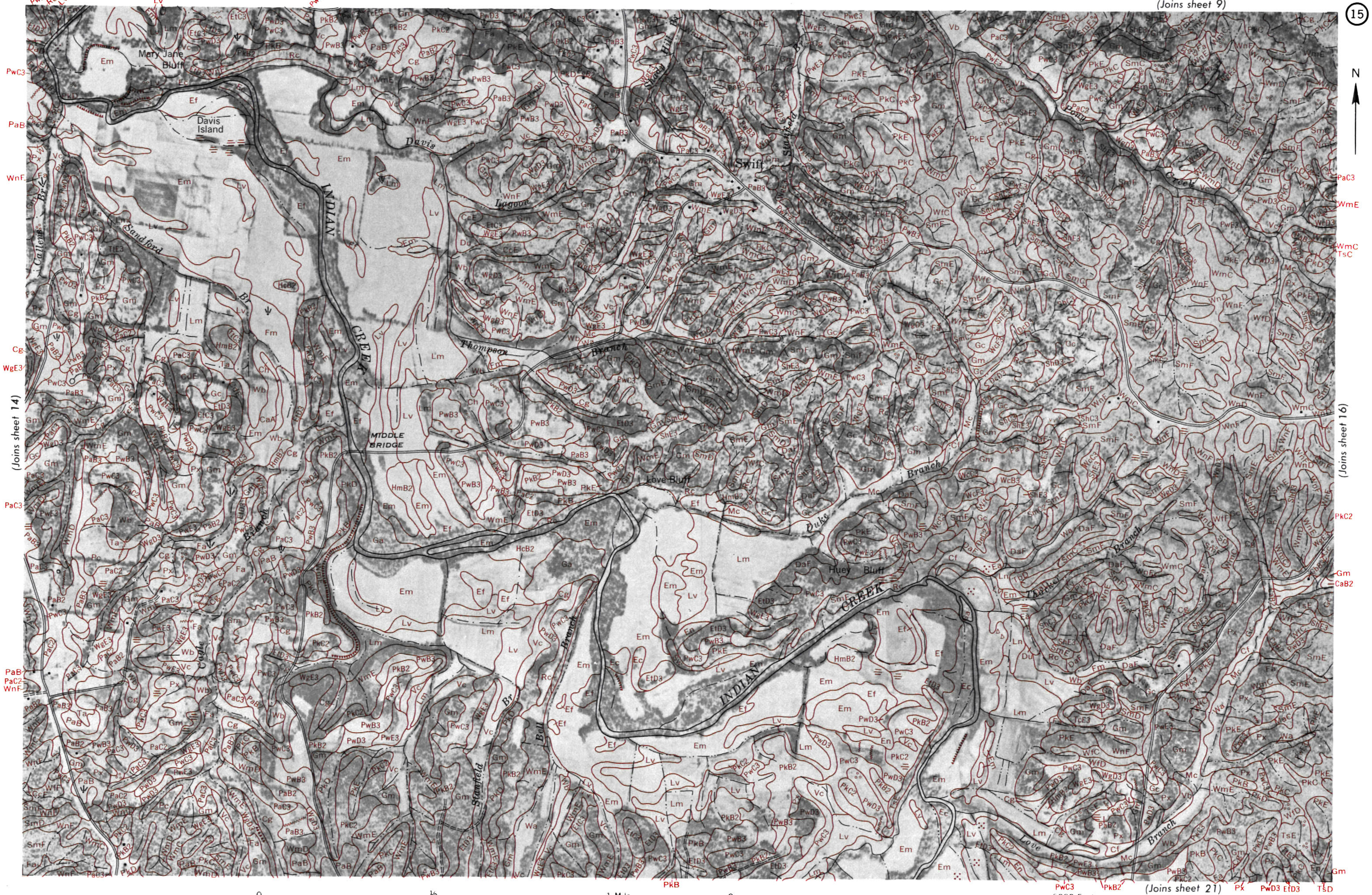
This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet


14
(Joins sheet 8)
(Joins sheet 13)
(Joins sheet 15)
(Joins sheet 20)
N
WHITE OAK CREEK
WHITE OAK CREEK
WHITE OAK CR
TENNESSEE RIVER
KENTUCKY LAKE
St Pauls Church
Oakland Church
Union School
Hookers Bend
HOOKERS BEND
Haislip Branch
Haislip Slough
Maple Slough
Filgo Br
WoB
WnE
Me
WmE
WnE
PaC3
WnD
WgE3
WmC
Cg
PwC3
Gm
WgD3
WmE
PaB2
SmF
PwB3
PwC3 PwB3
PwC3
WgD3
WoB
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

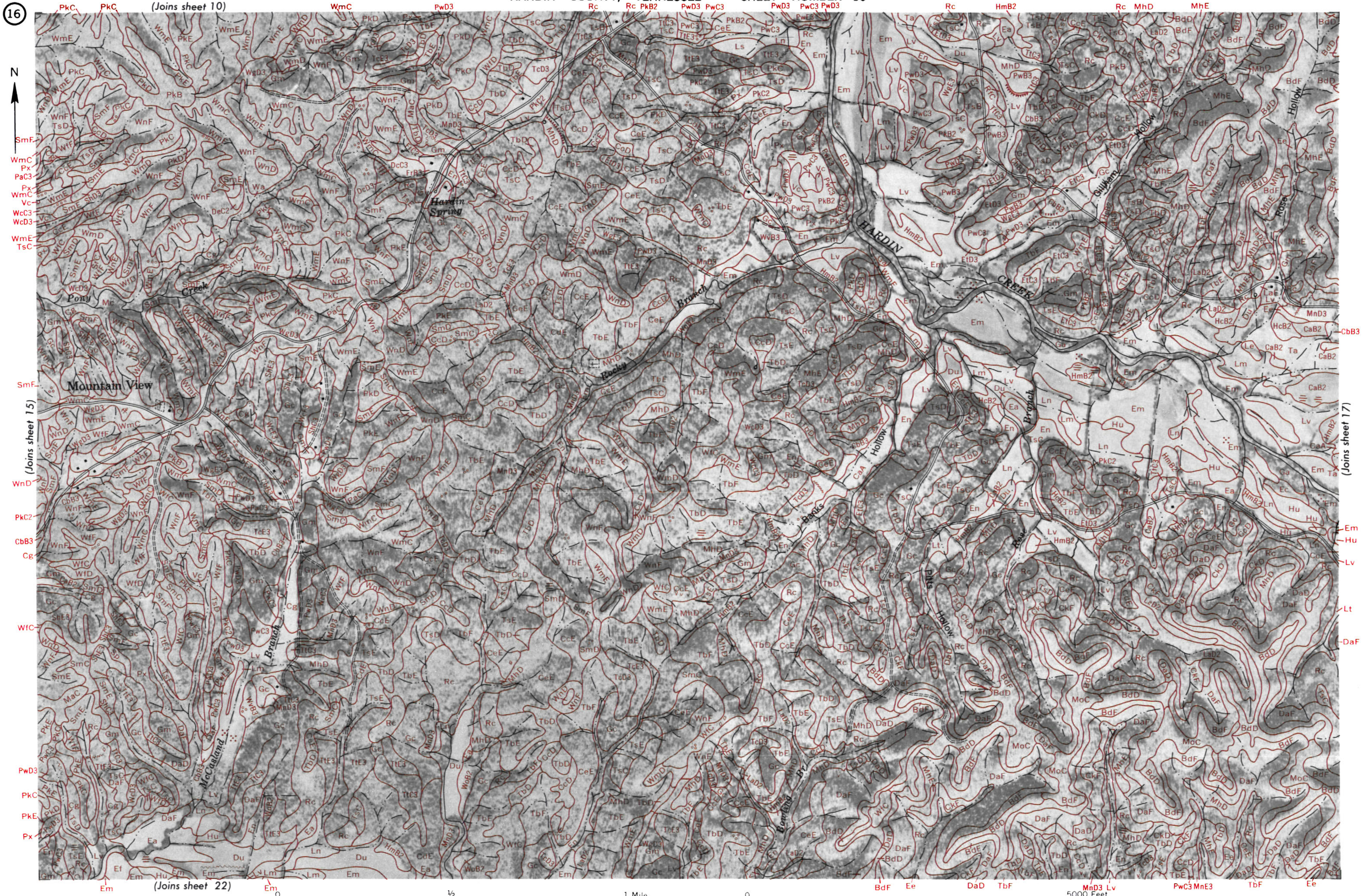
15

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 16



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 11)

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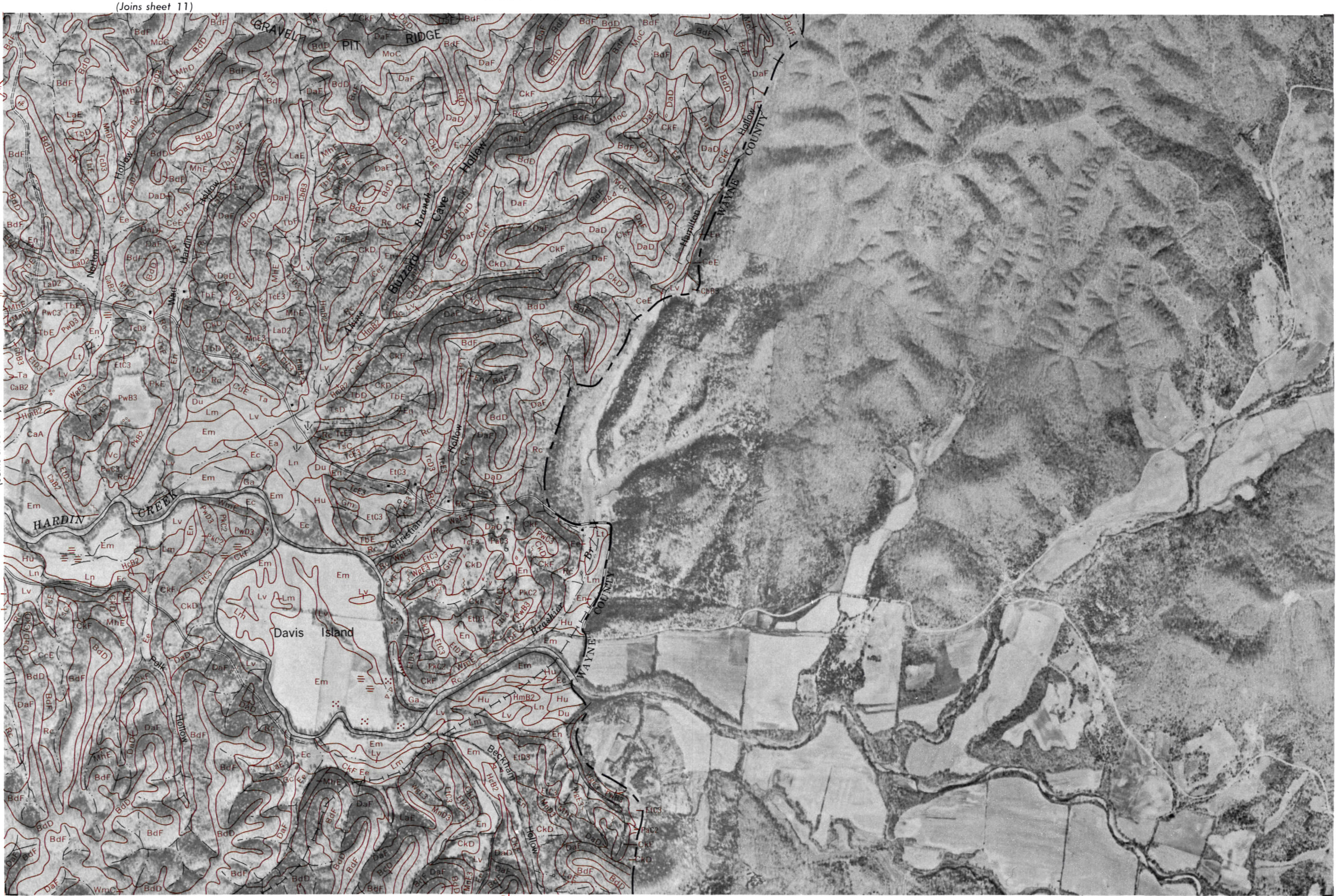
(Joins sheet 16)



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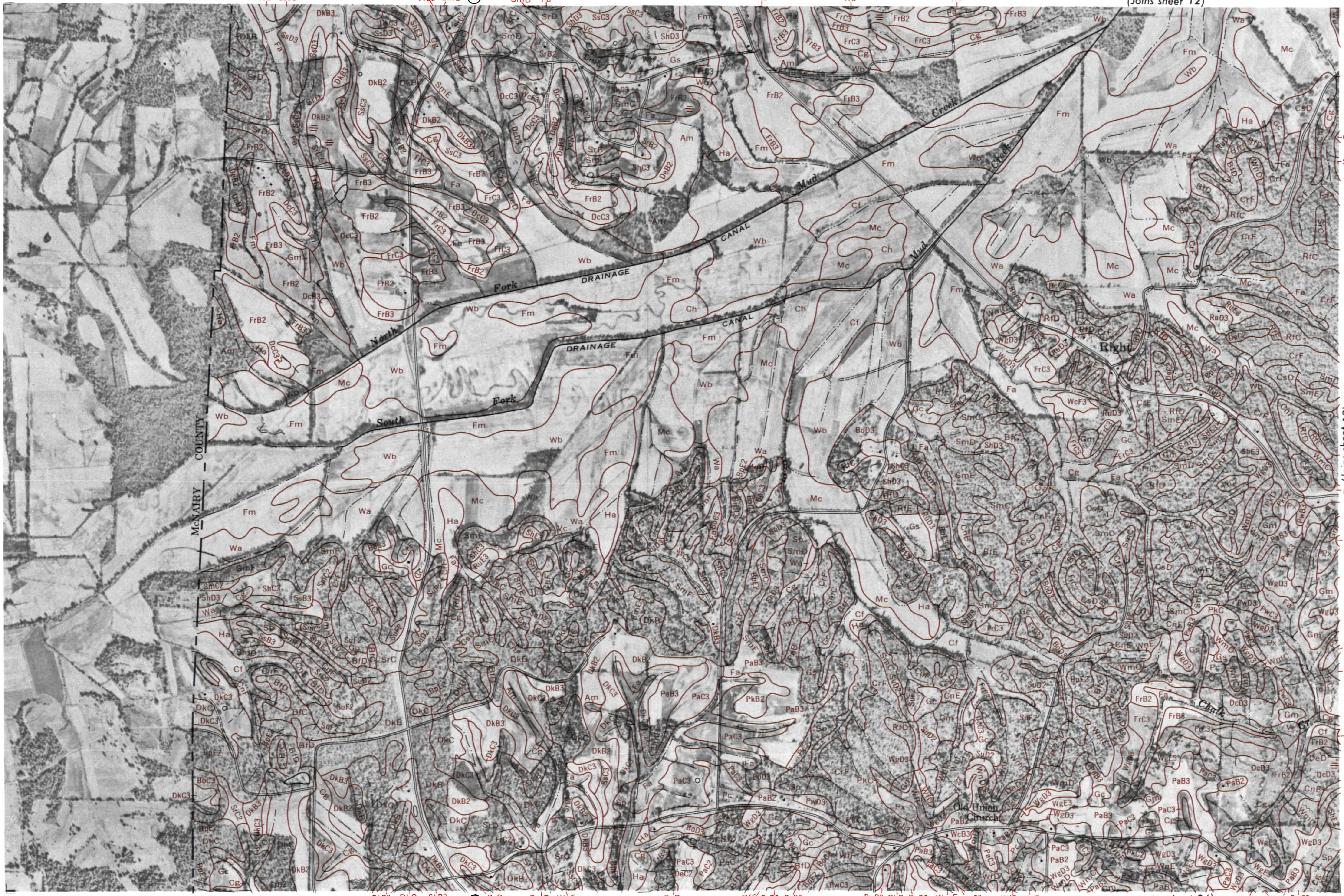
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 18

N

(Joins sheet 12)



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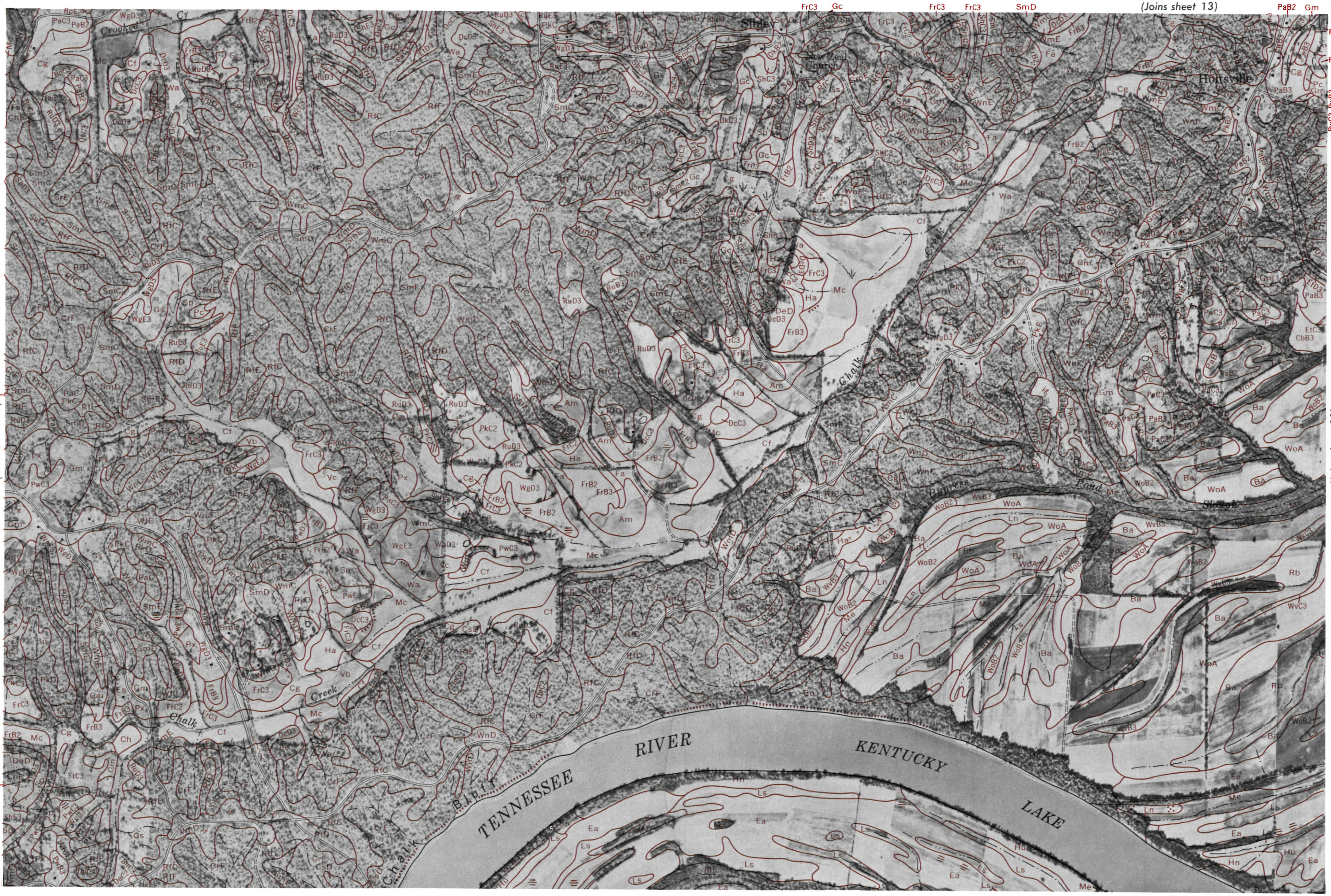
(19)

(Joins sheet 13)

(Joins sheet 18)

(Joins sheet 20)



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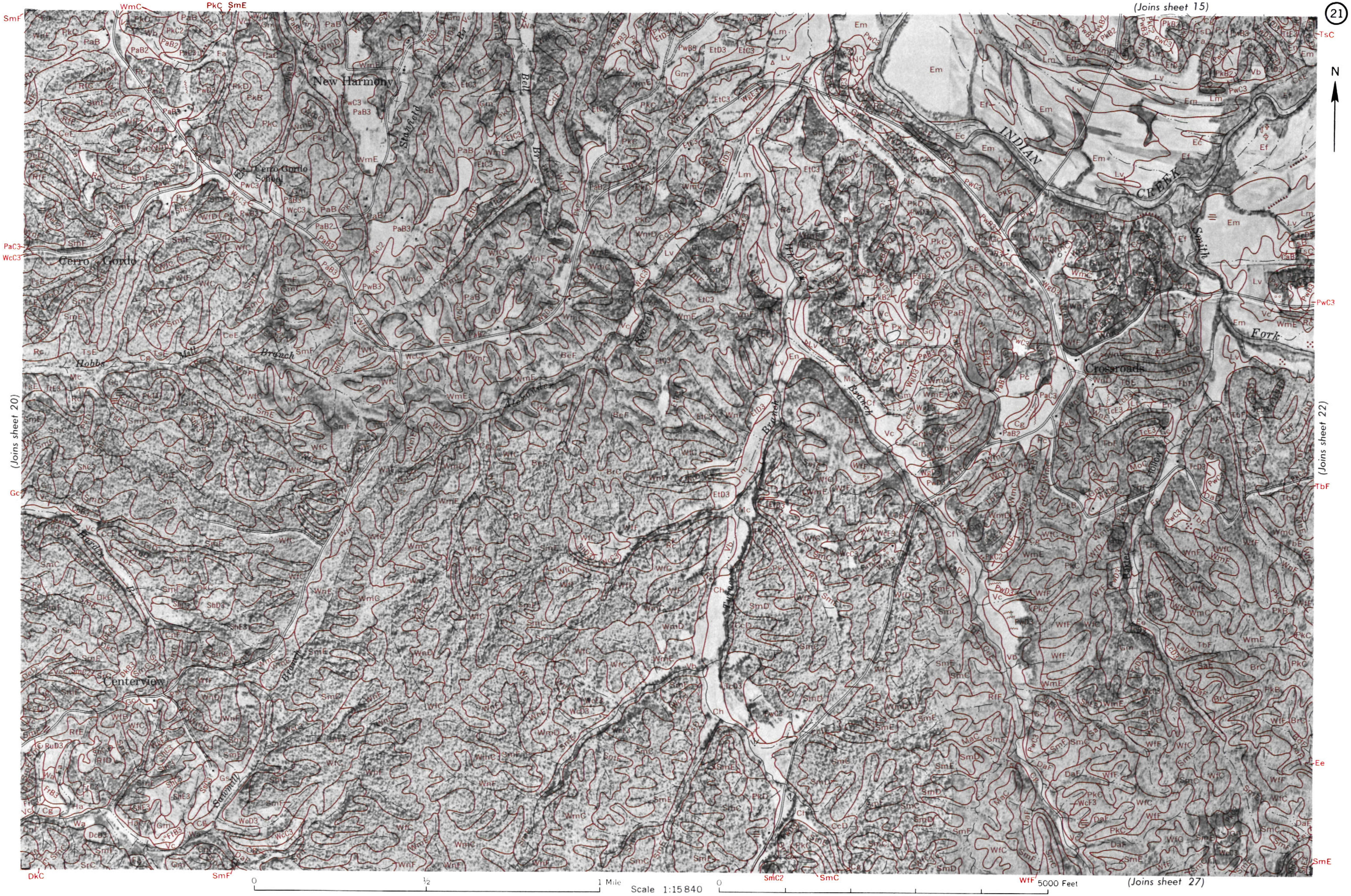
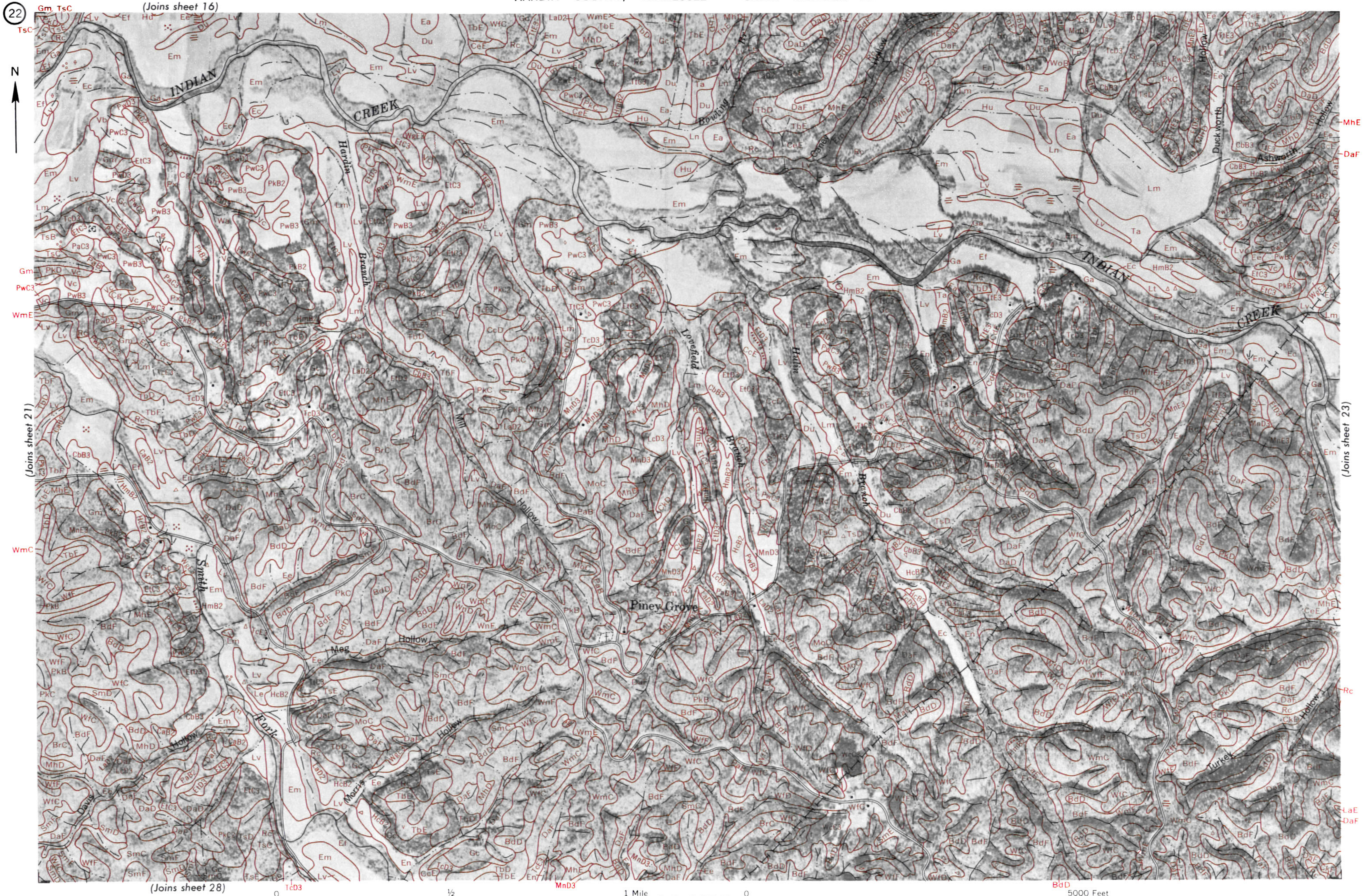
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 20



This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

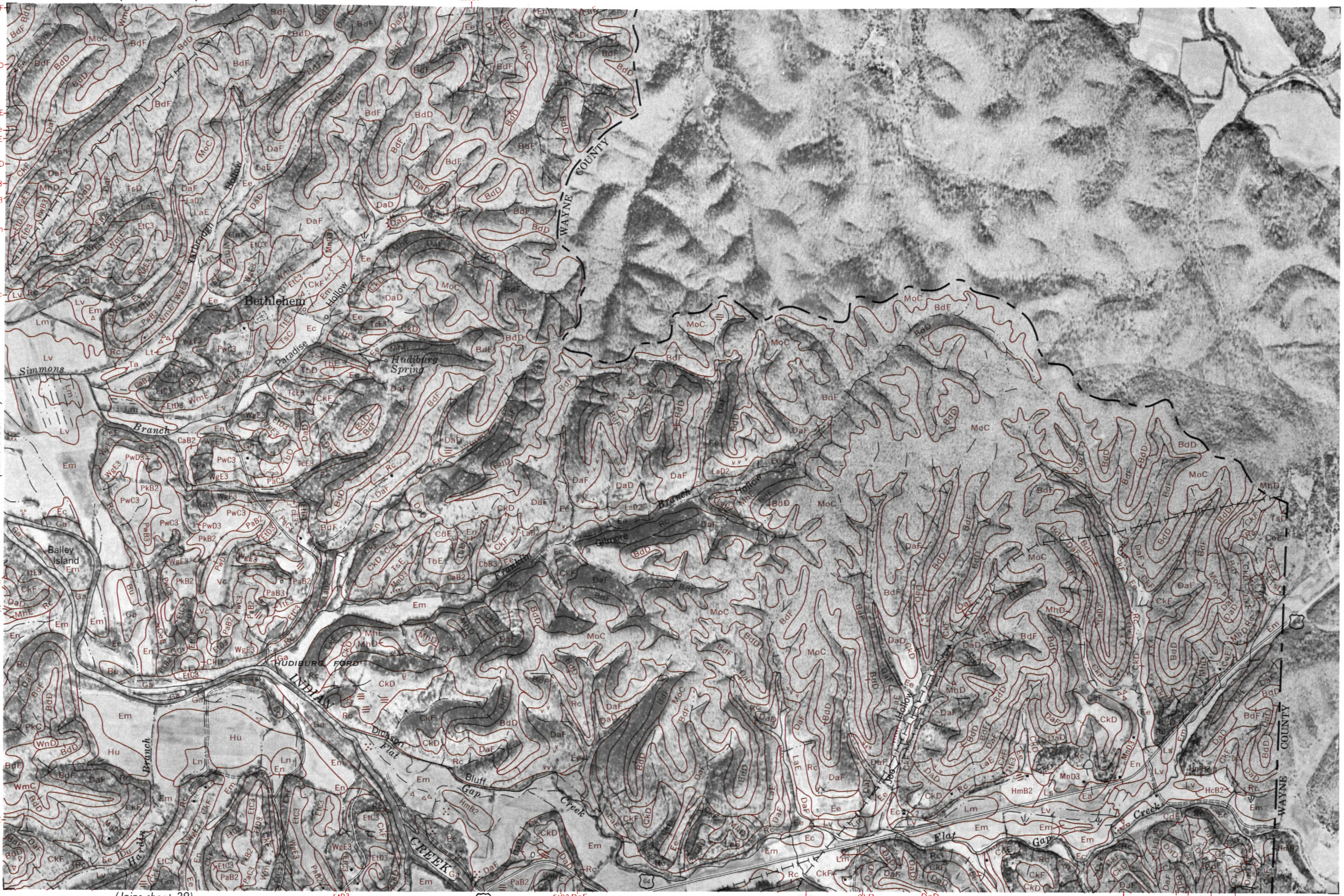
22



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

23

(Joins sheet 17)



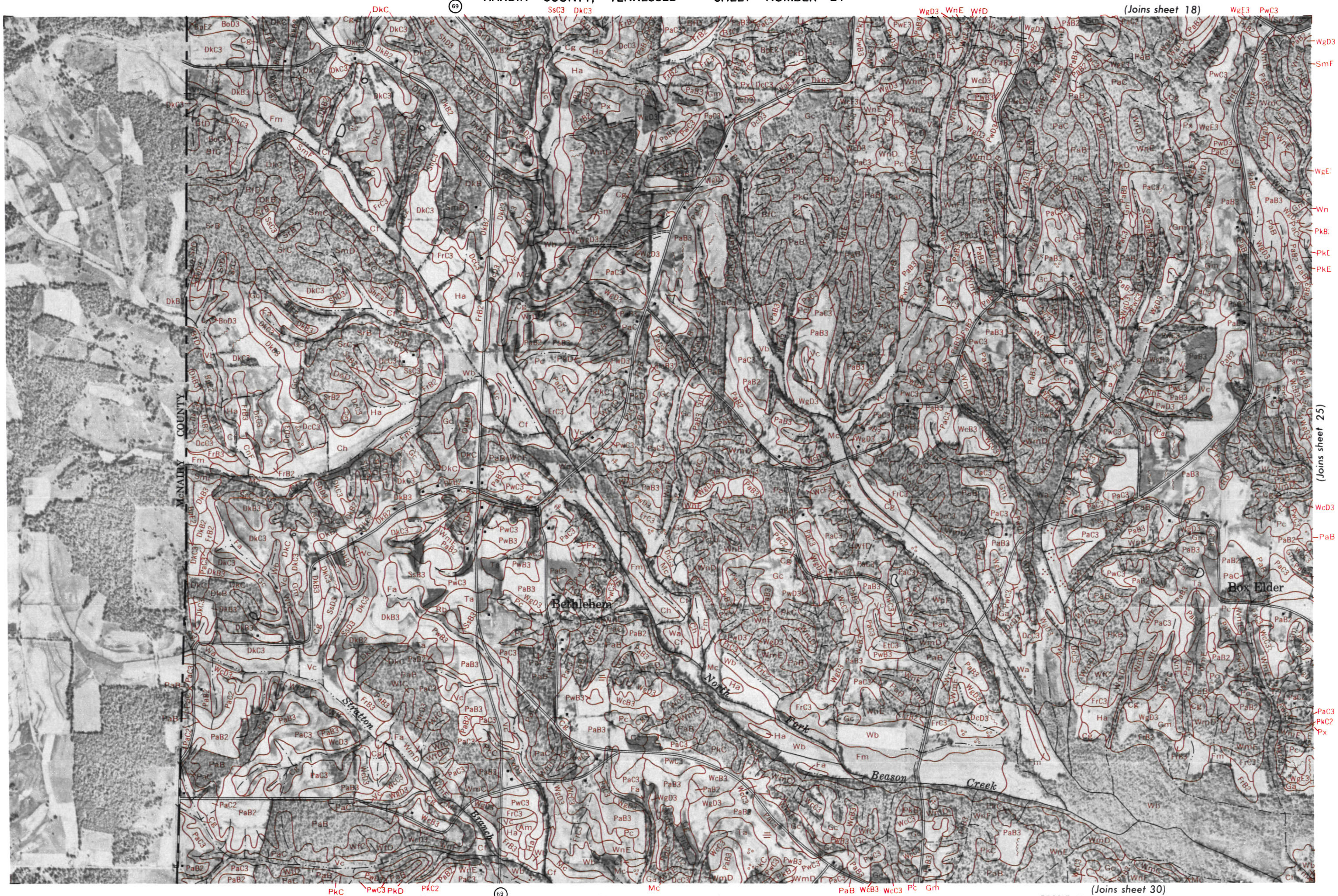
(Joins sheet 22)

(Joins sheet 29)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1956.

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 24



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HARDIN COUNTY, TENNESSEE — SHEET NUMBER 25

25

(Joins sheet 19)

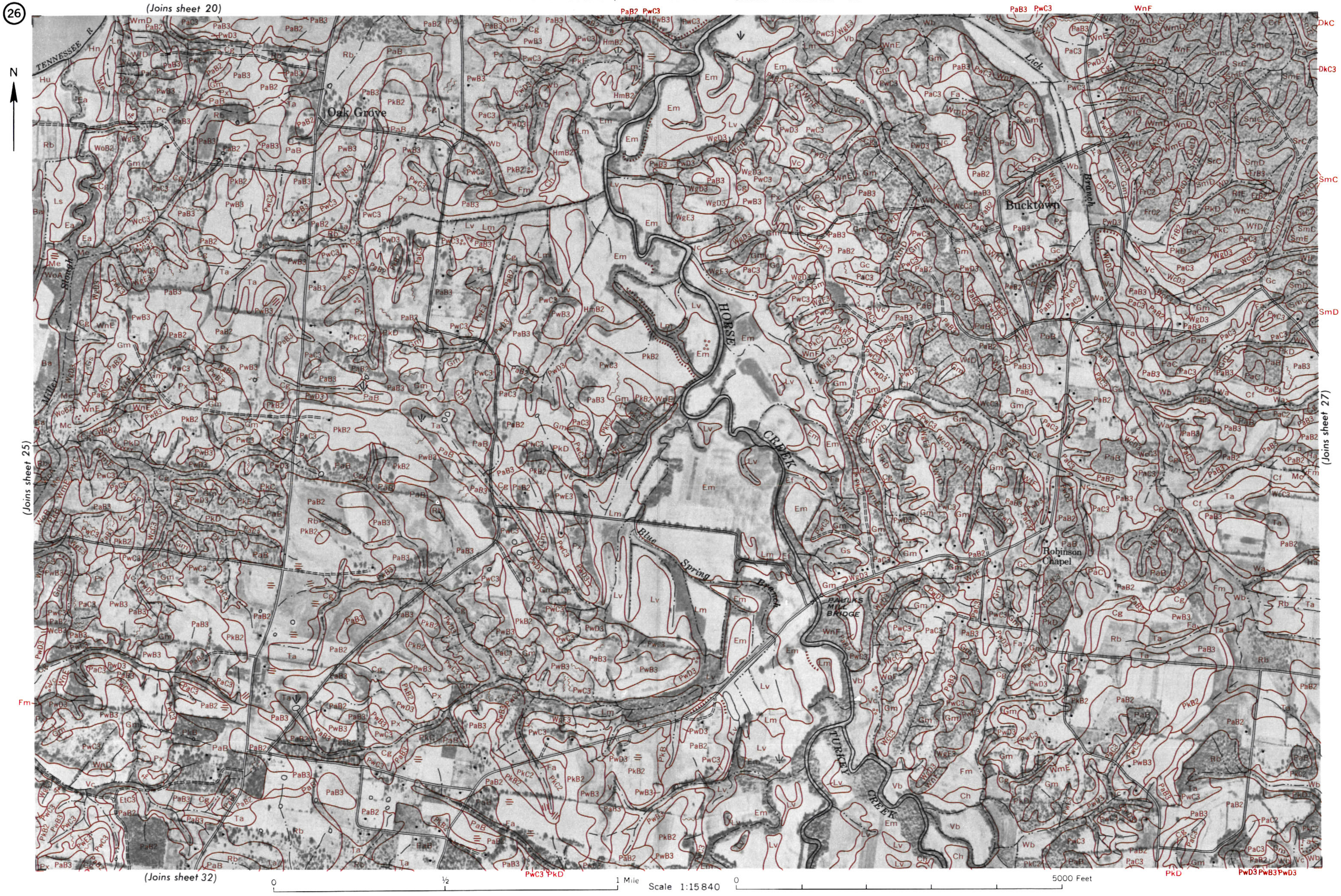
(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 31)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

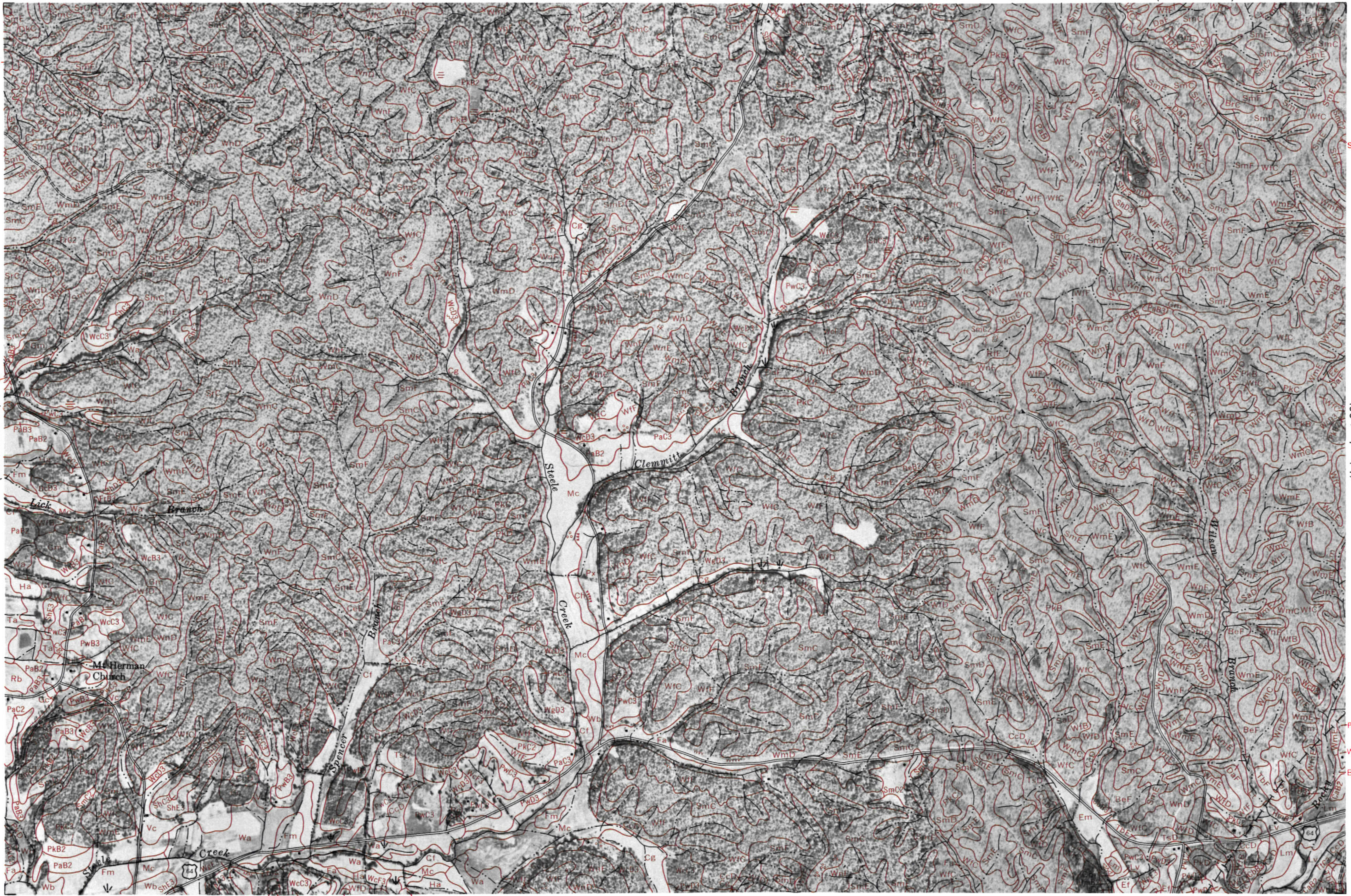
This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture Washington 25, D. C. This map compiled from aerial photographs flown in 1955.


(Joins sheet 20)
(Joins sheet 25)
(Joins sheet 27)
(Joins sheet 32)
N
TENNESSEE R
Oak Grove
Bucktown
Robinson Chapel
HORSE CREEK
Blue Spring Branch
TURKEY CREEK
Lick Branch
Miller Slough
PAULKS MILL BRIDGE
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

27

(Joins sheet 21)

(Joins sheet 26)



(Joins sheet 28)

(Joins sheet 33)

WgD3 WnD WgE3 WgE3 WfF

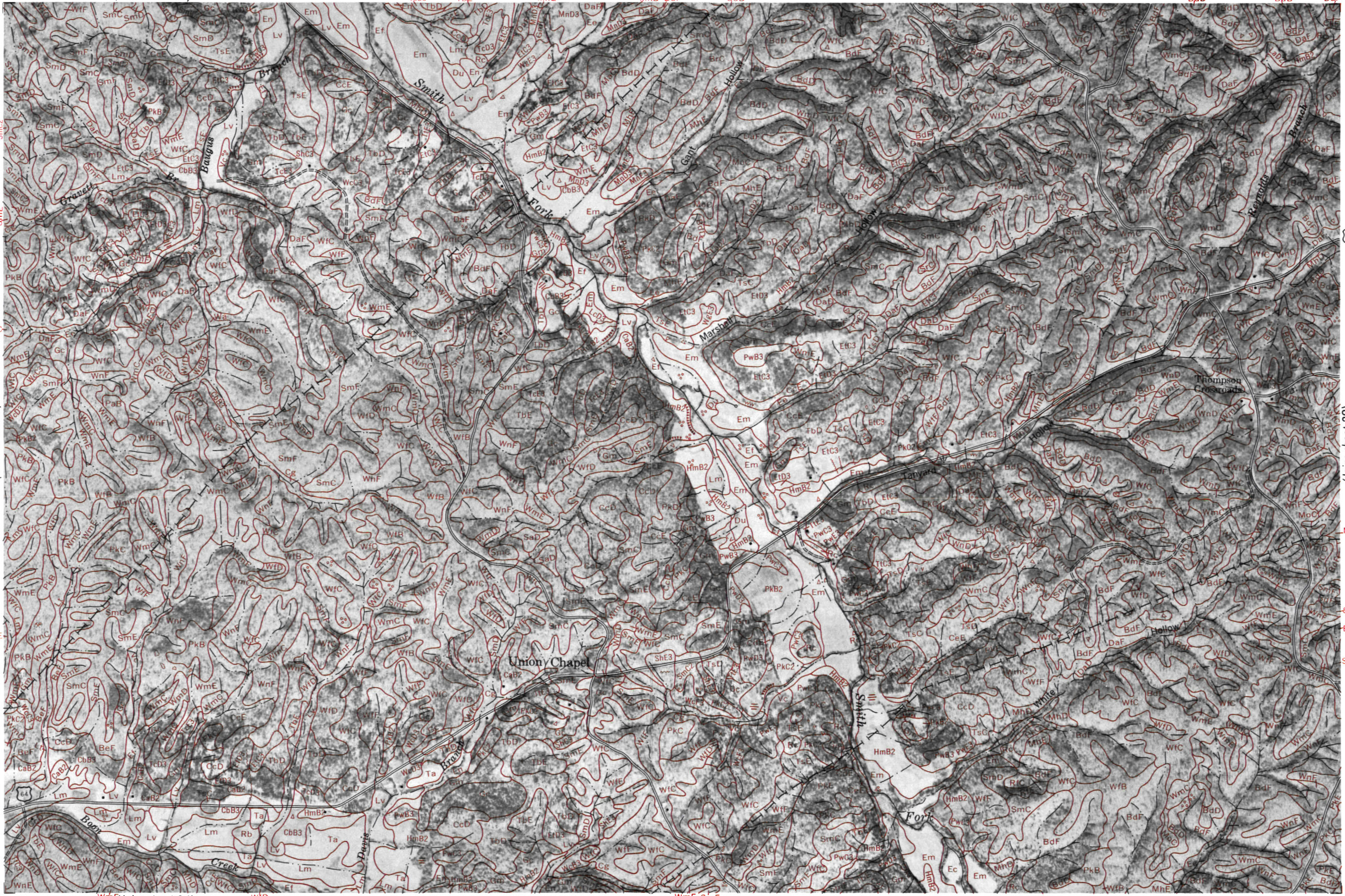
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 28

(Joins sheet 22)

(Joins sheet 27)



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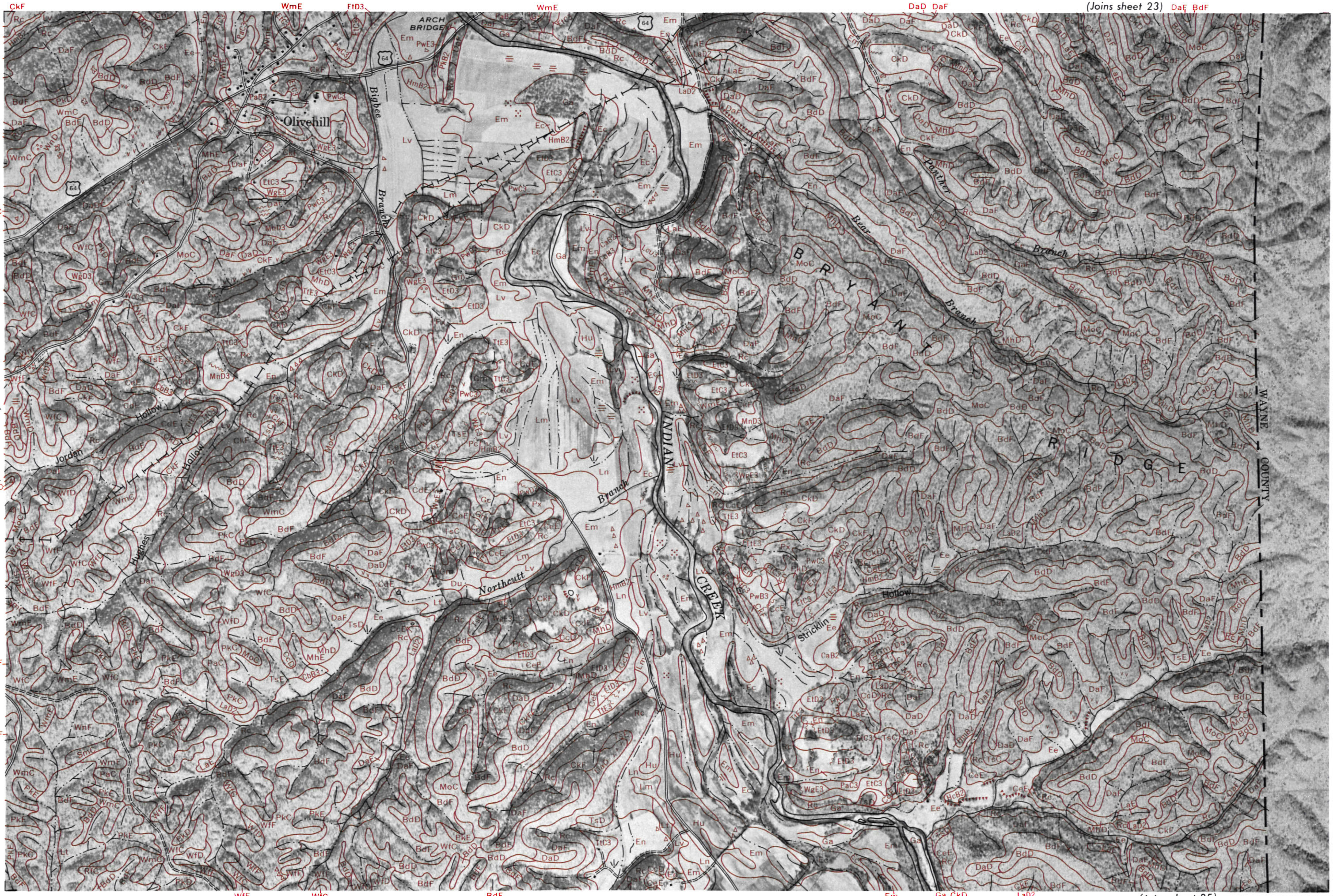
(Joins sheet 34)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 23)

(Joins sheet 28)



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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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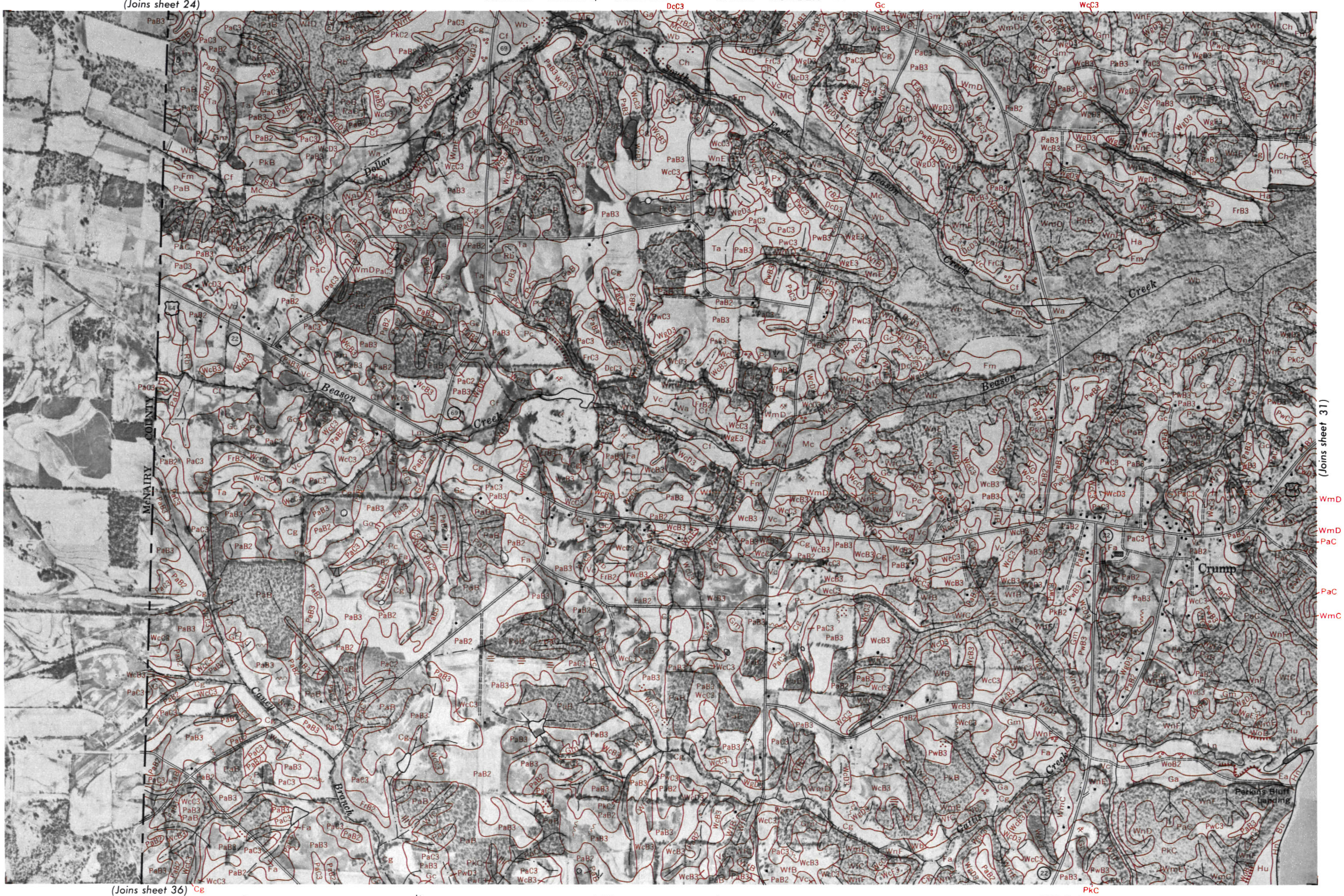
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 30

(Joins sheet 24)



(Joins sheet 31)

(Joins sheet 36)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

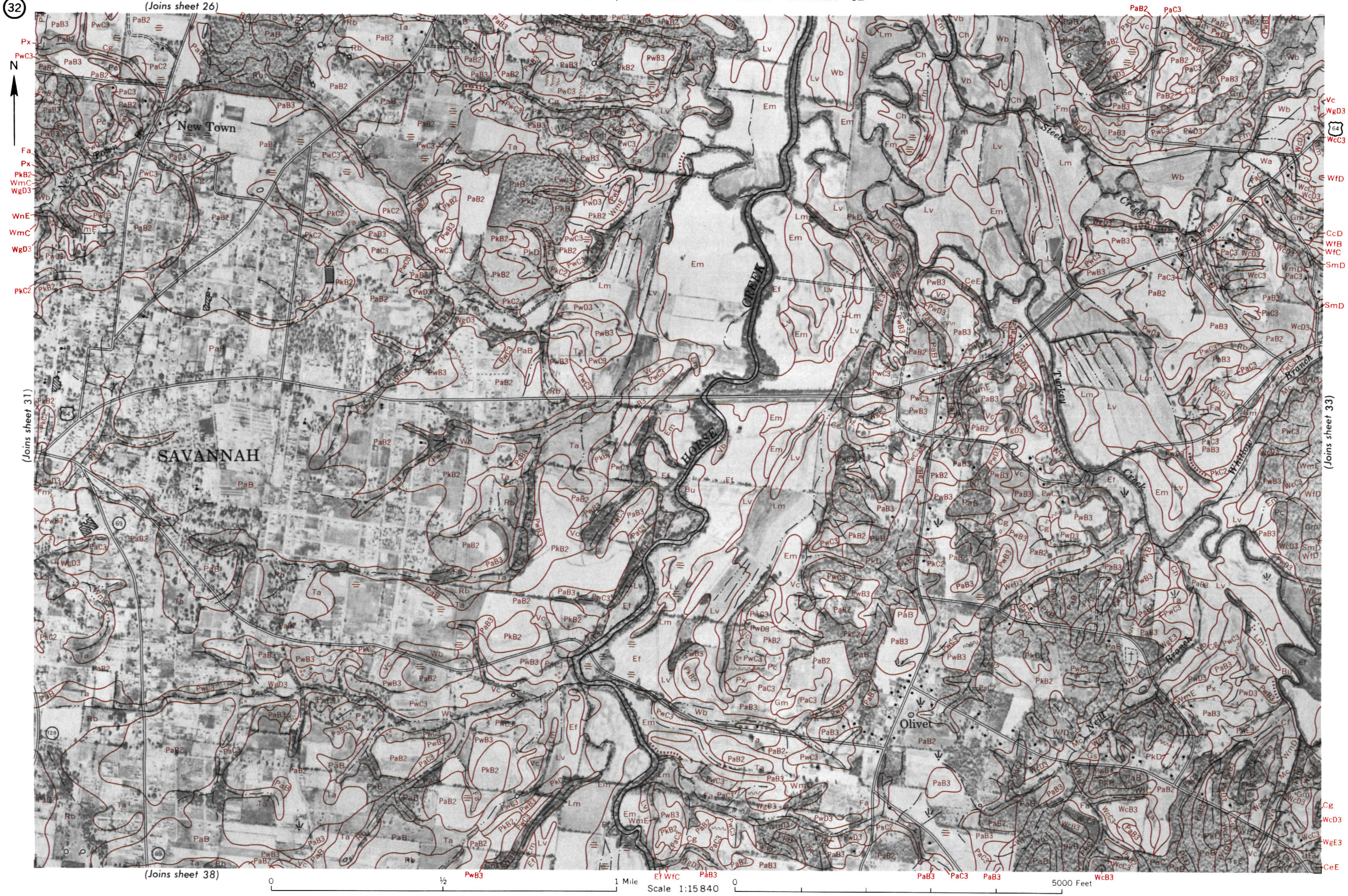
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 31

31

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

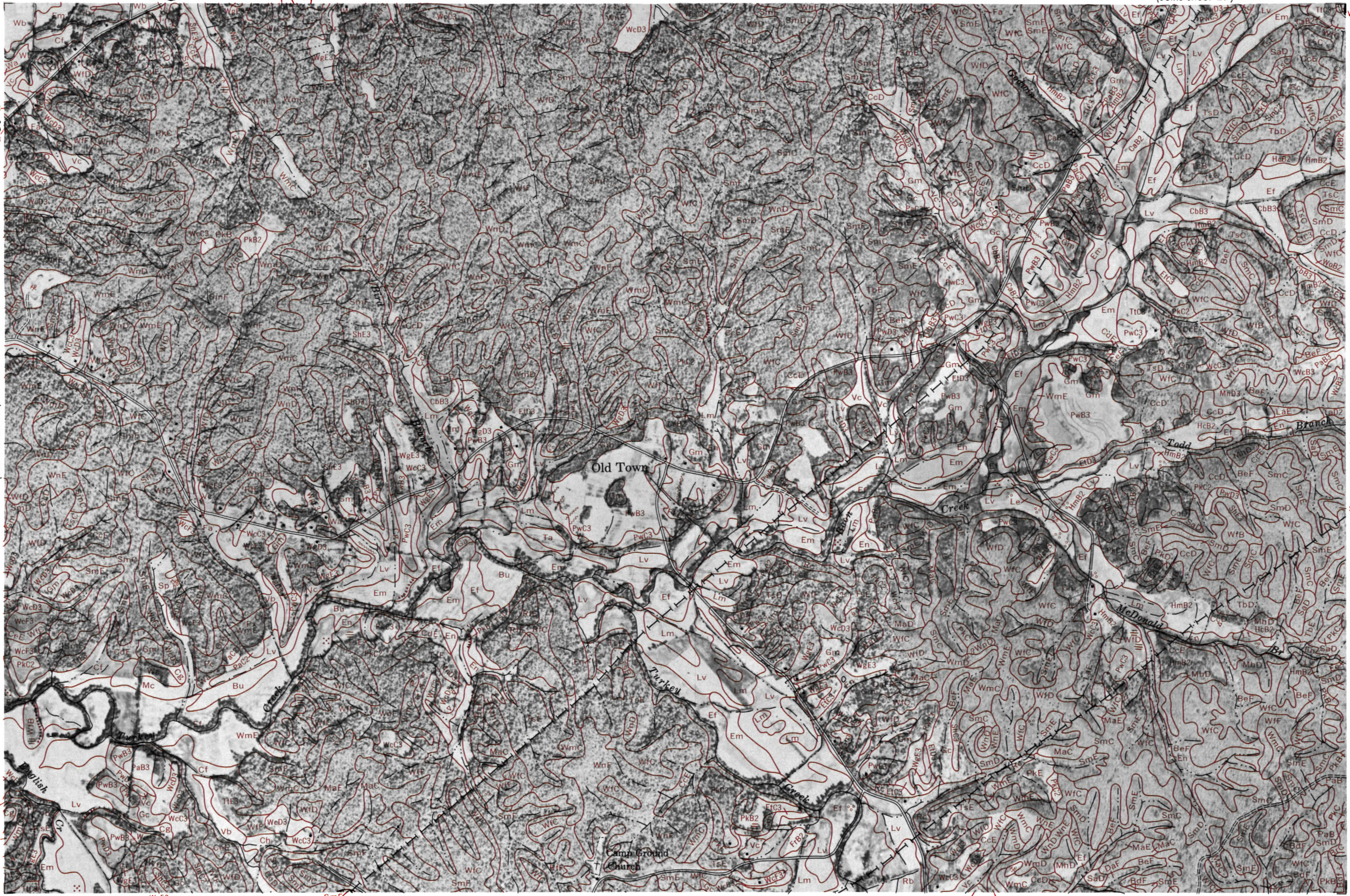
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 32



HARDIN COUNTY, TENNESSEE — SHEET NUMBER 33

(Joins sheet 27)

33



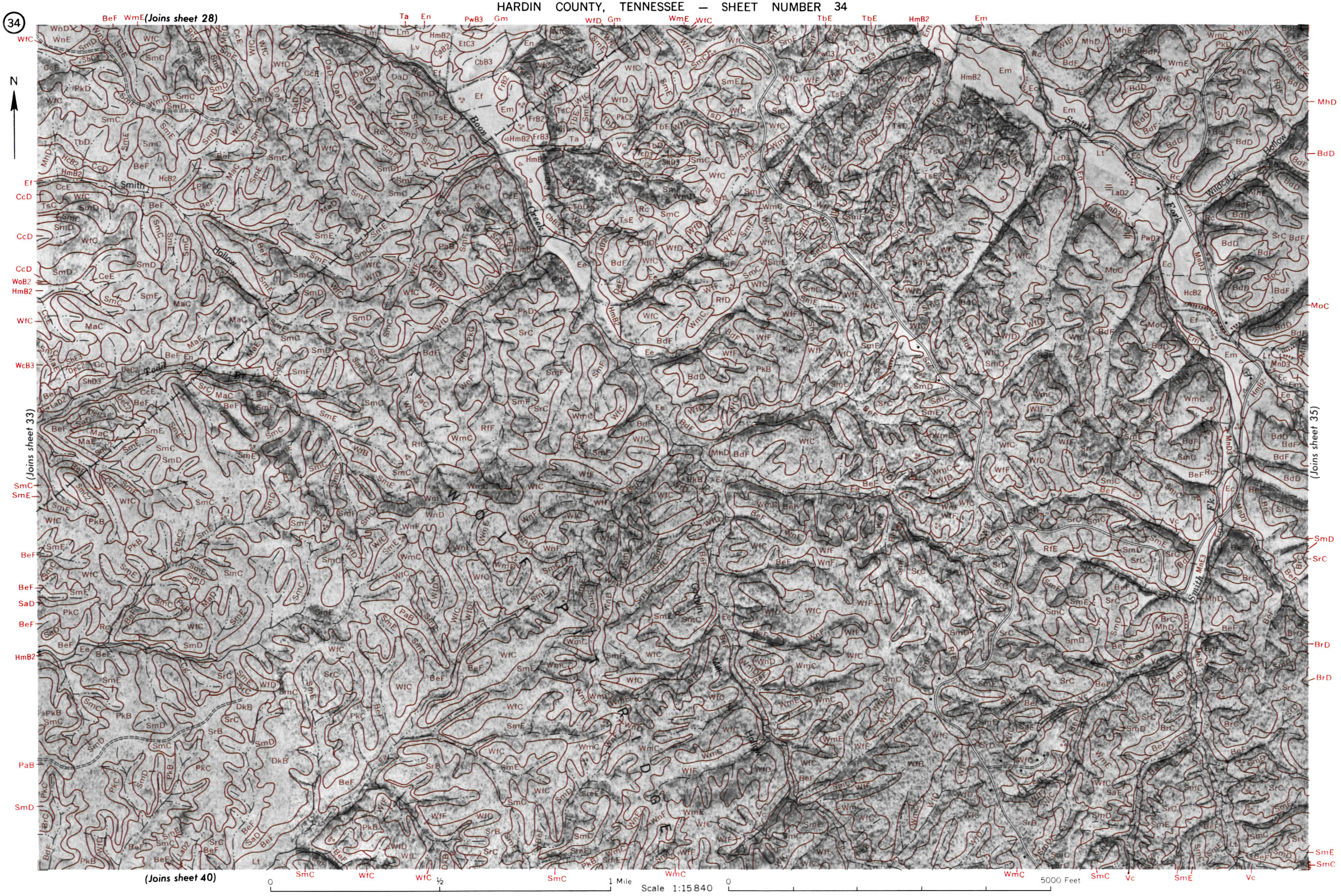
(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 39)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

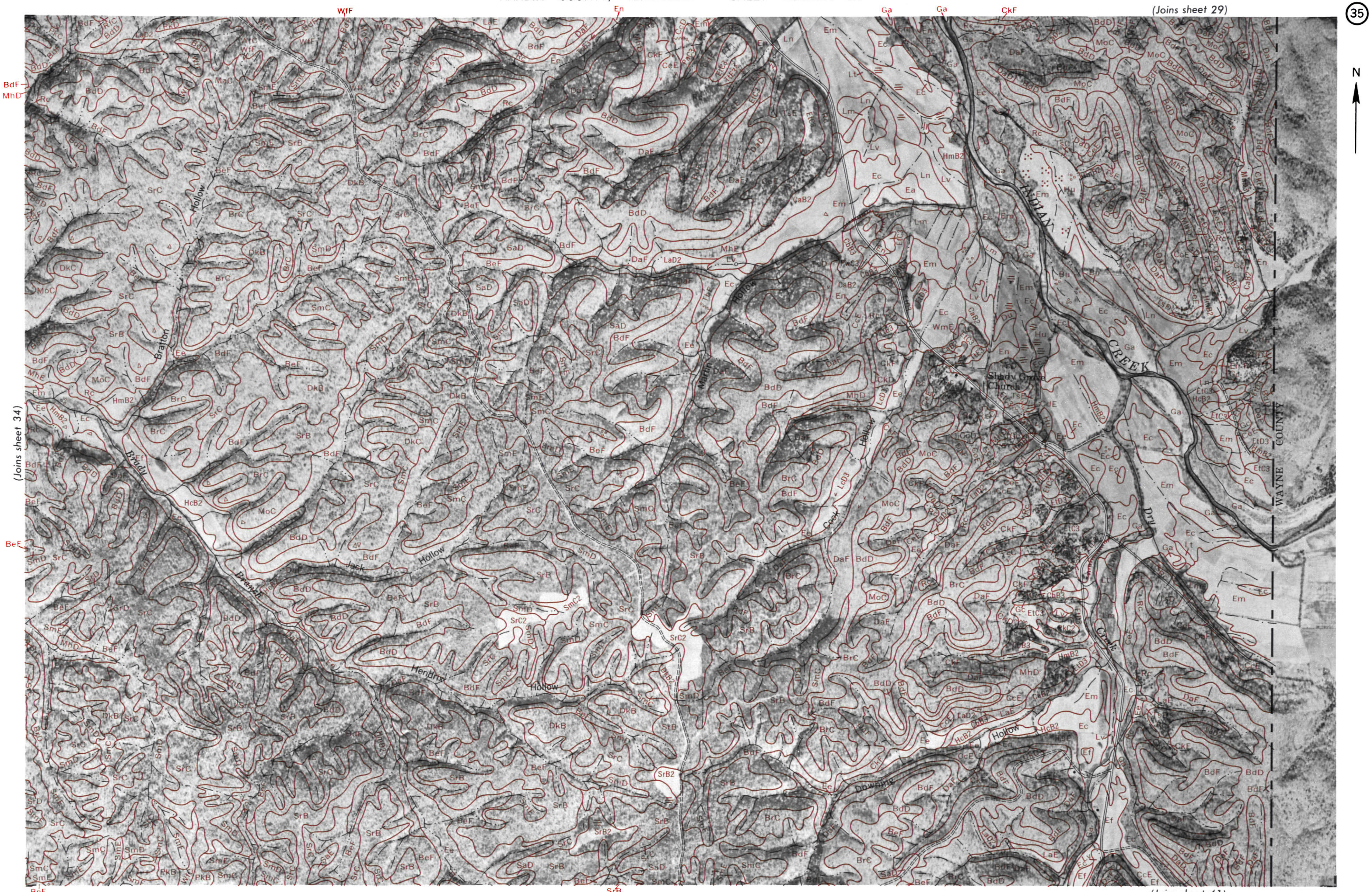

34
N
(Joins sheet 28)
(Joins sheet 33)
(Joins sheet 35)
(Joins sheet 40)
Scale 1:15 840
0
½
1 Mile
0
5000 Feet

35

(Joins sheet 29)

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

(Joins sheet 34)

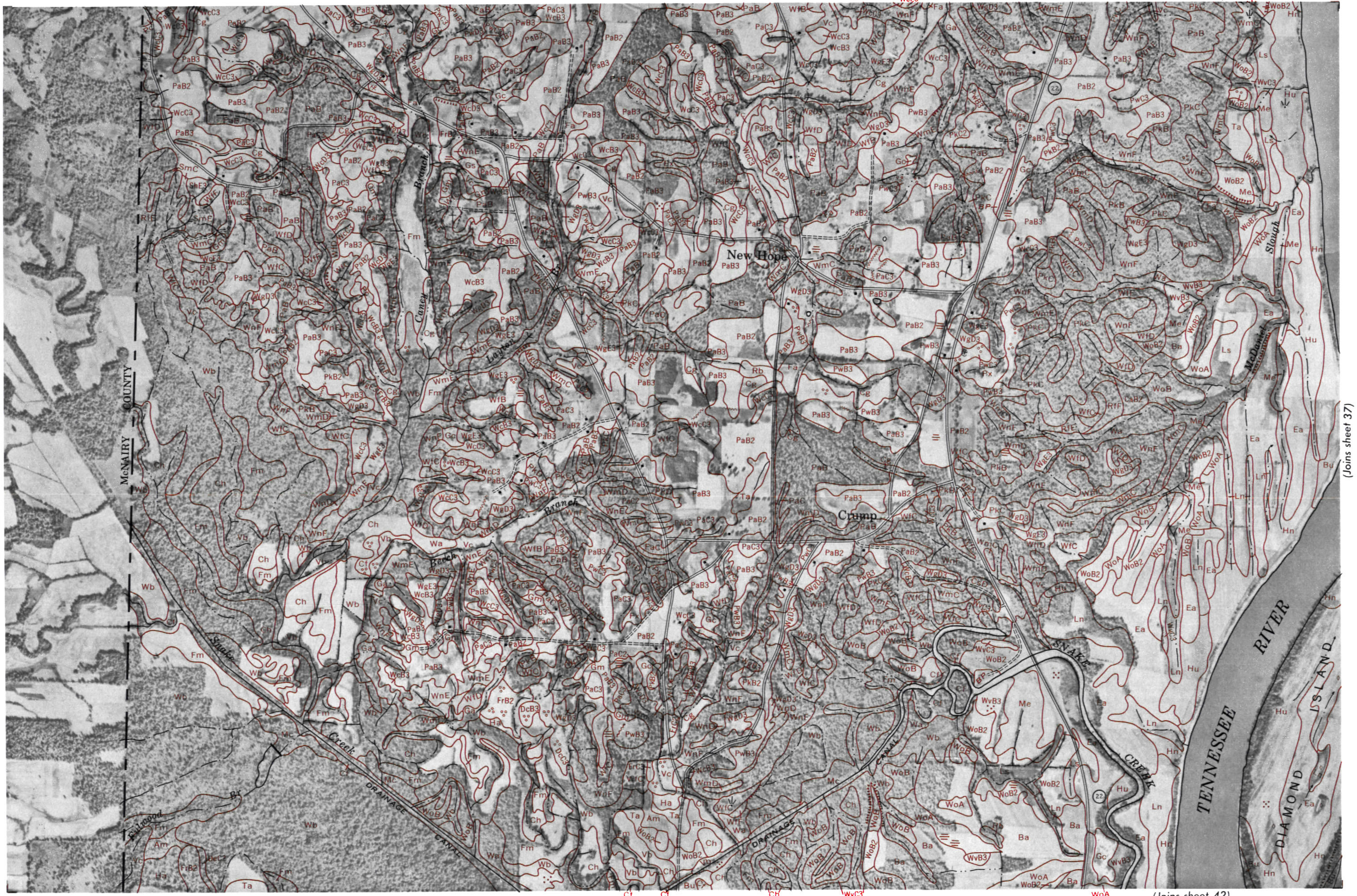


0 ½ 1 Mile Scale 1:15840 0 5000 Feet

(Joins sheet 41)

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 36

(Joins sheet 30)

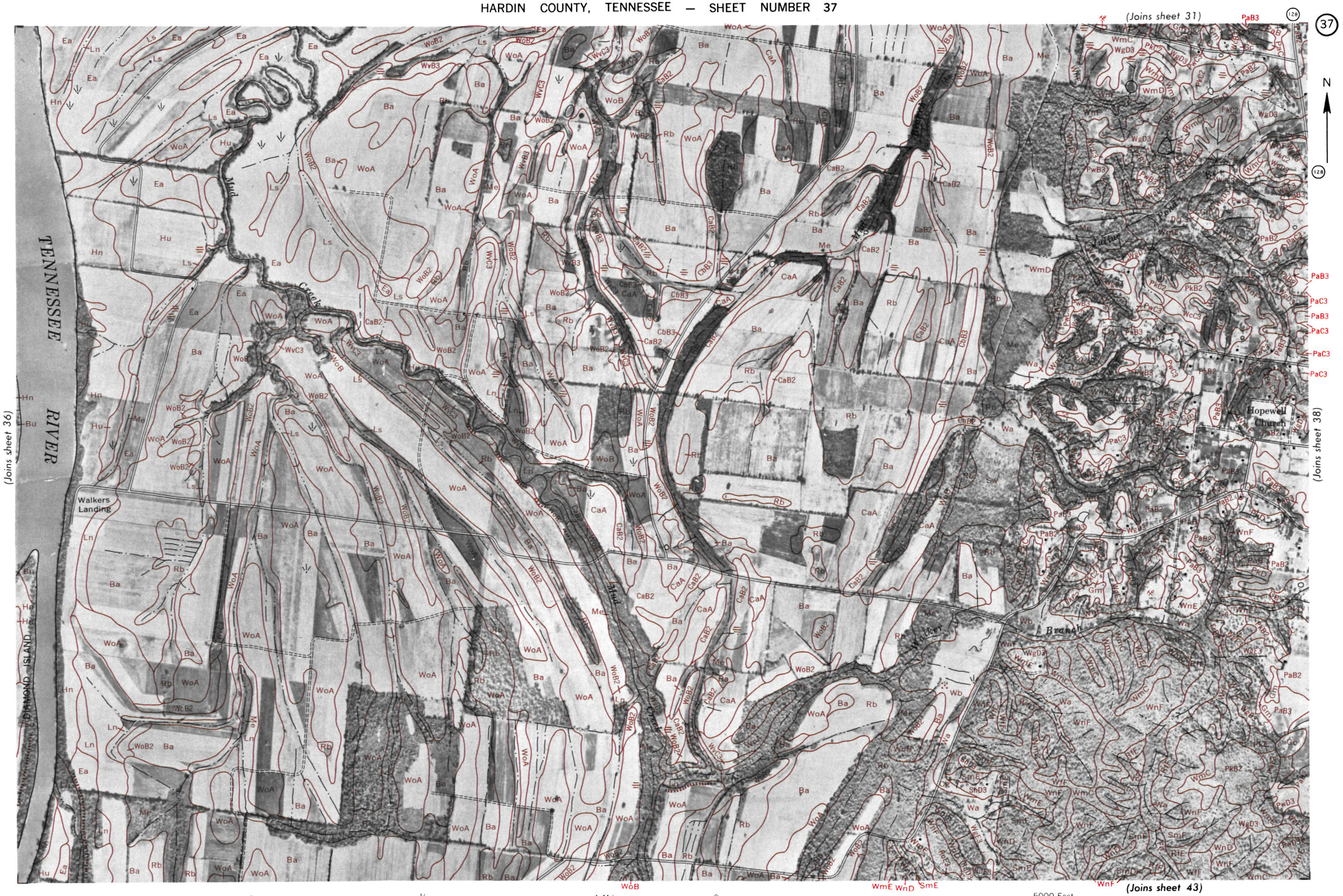


(Joins sheet 37)

(Joins sheet 42)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 37



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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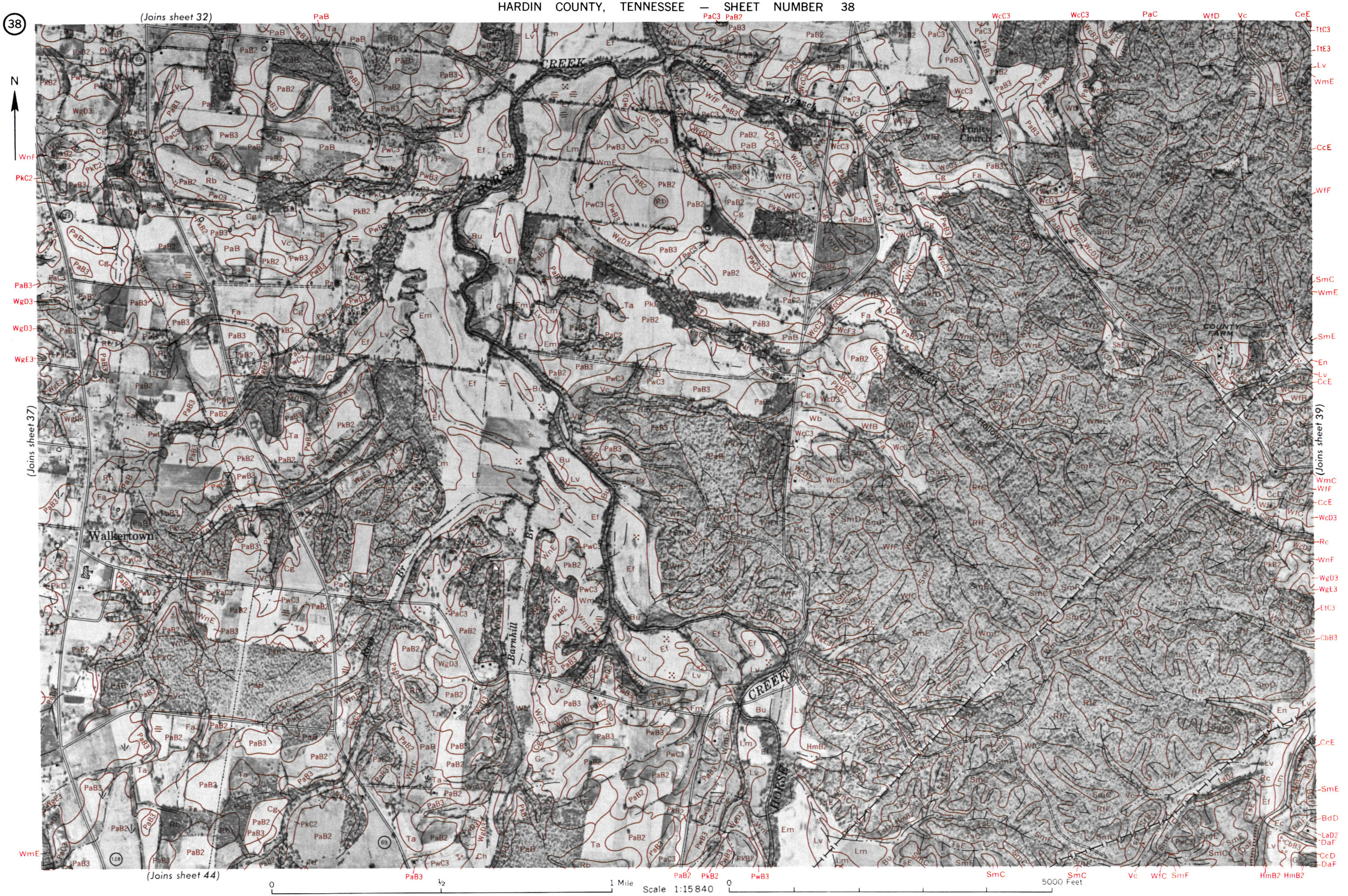
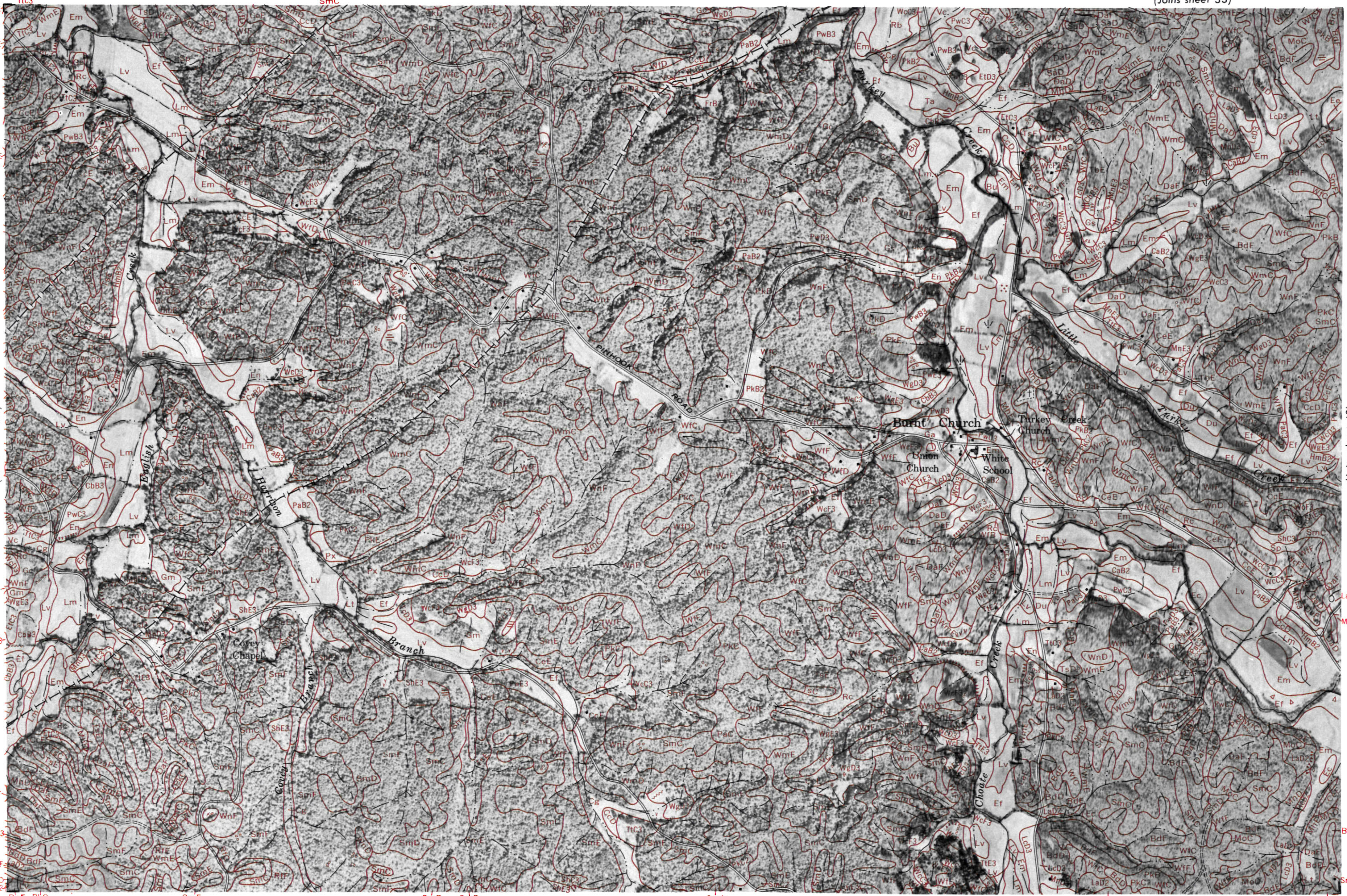
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 38



(Joins sheet 33)

(Joins sheet 38)

(Joins sheet 40)

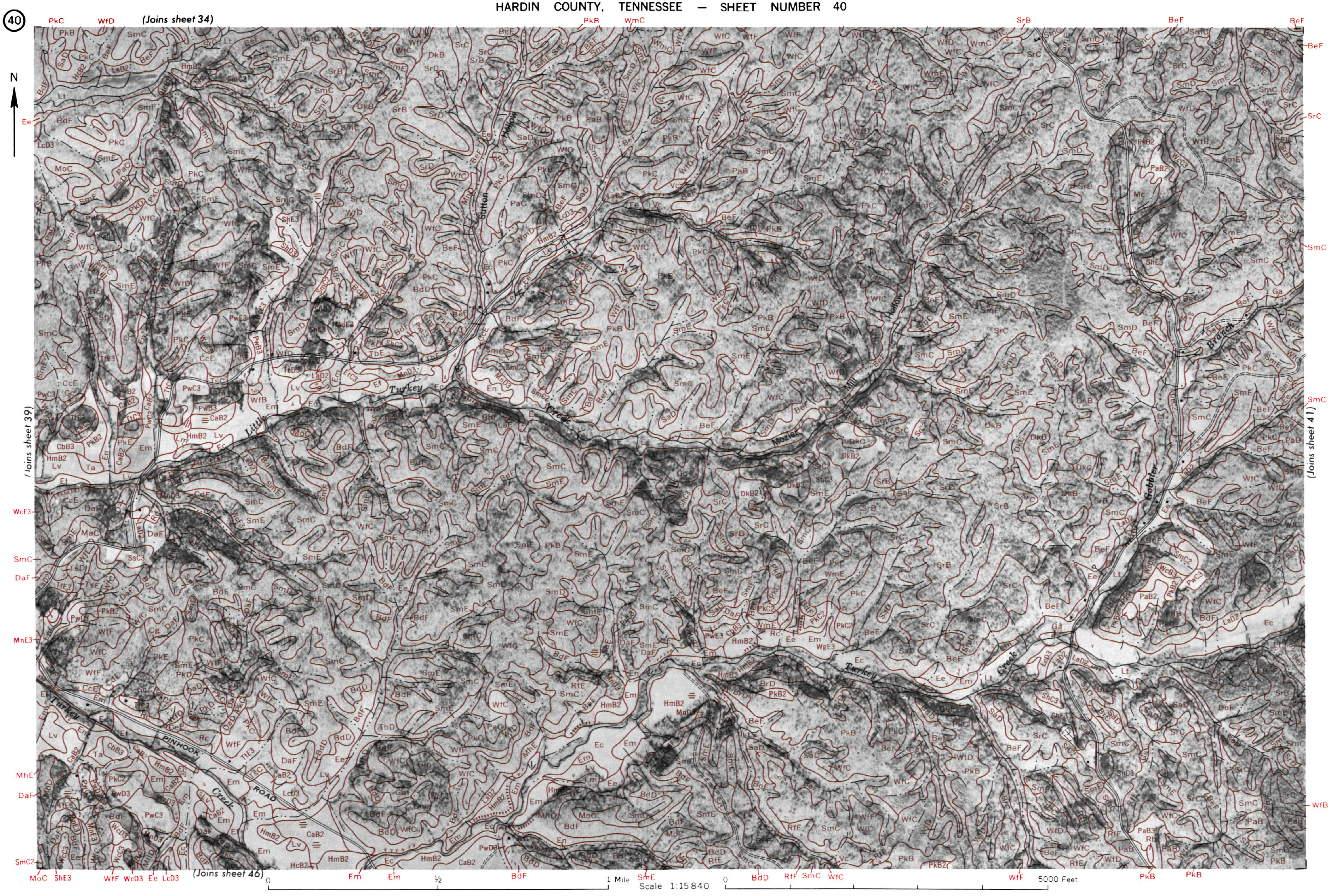


(Joins sheet 45)

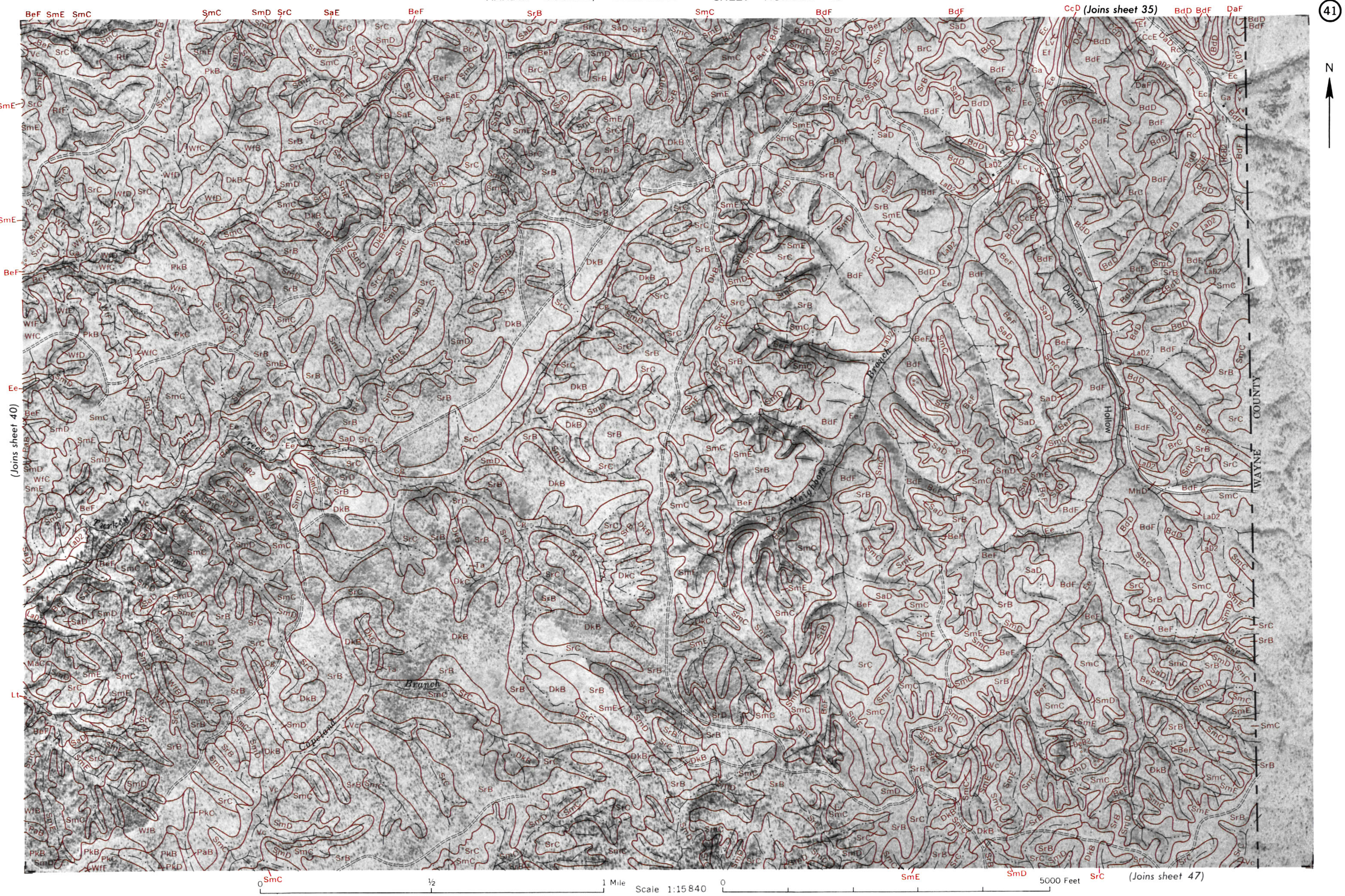
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 40



HARDIN COUNTY, TENNESSEE — SHEET NUMBER 41



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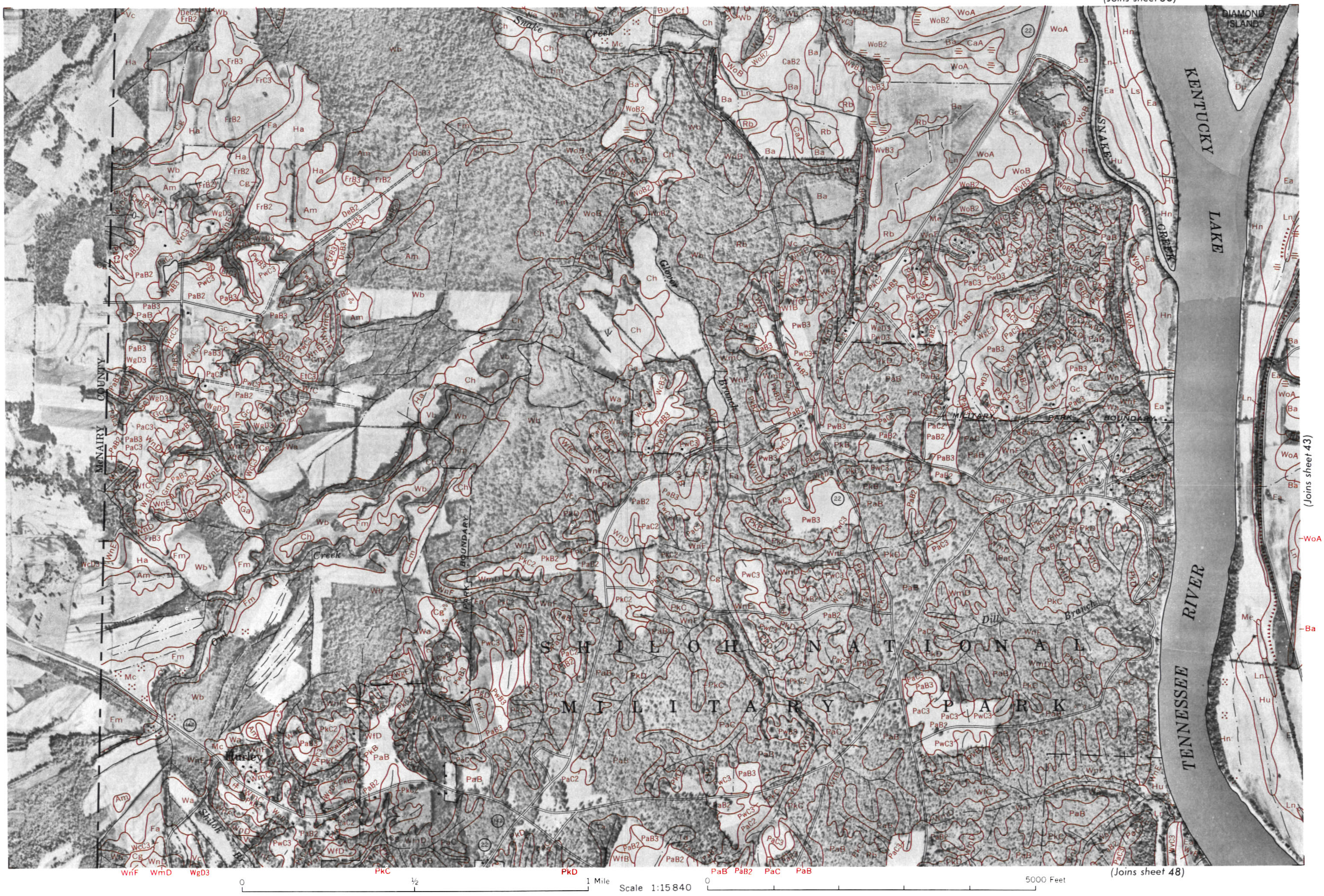
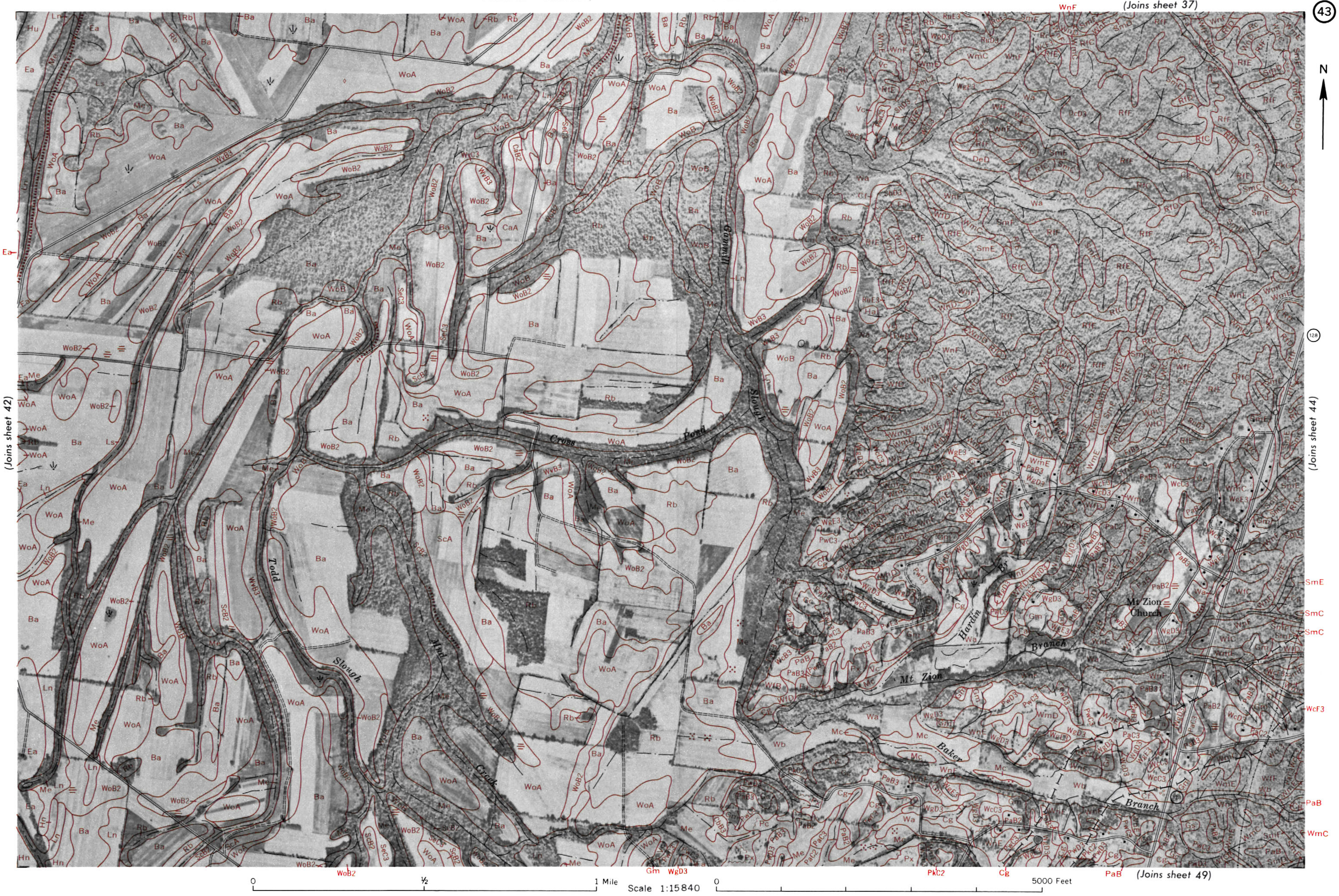
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 42





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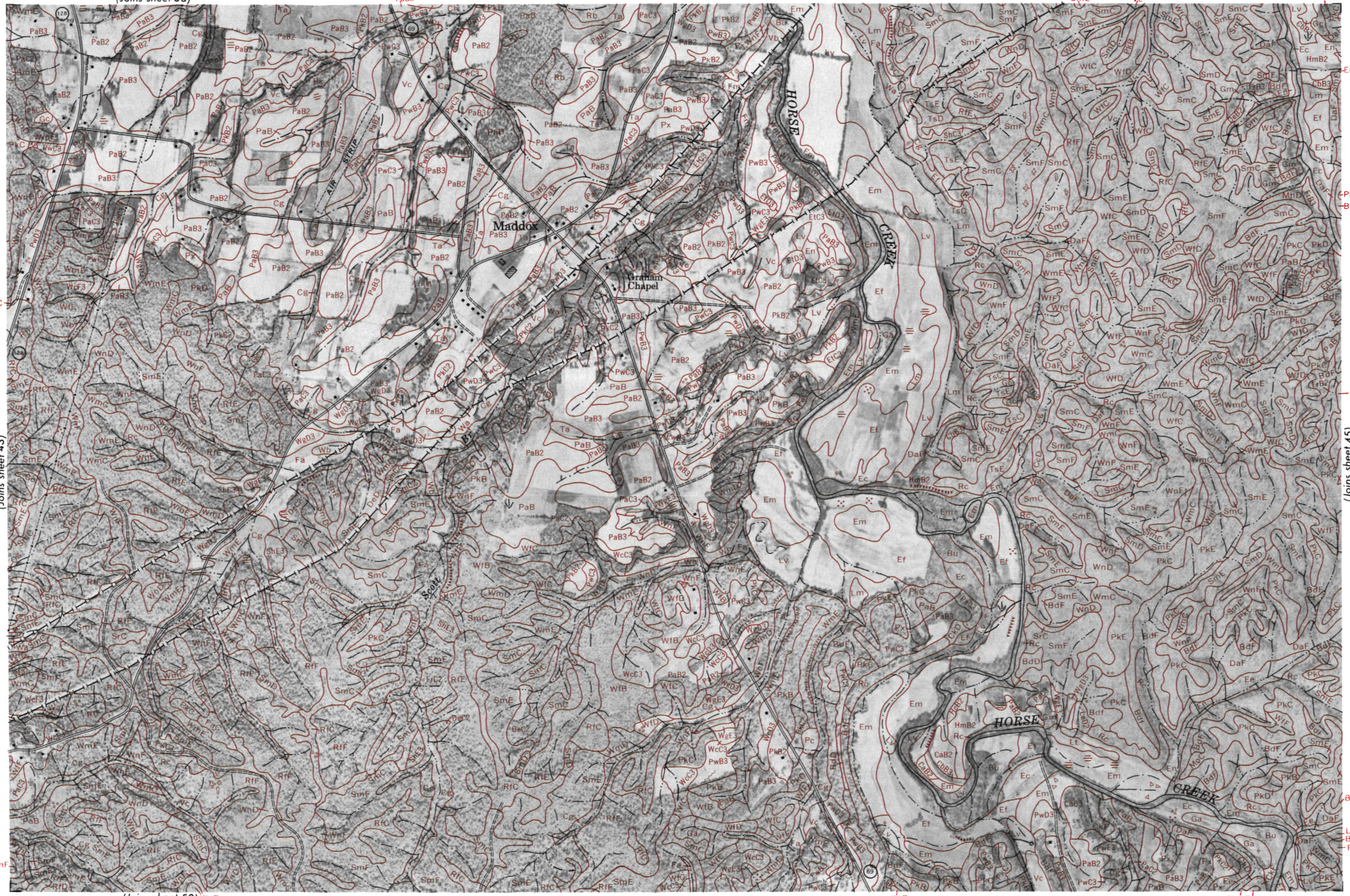
(Joins sheet 38)

(Joins sheet 43)

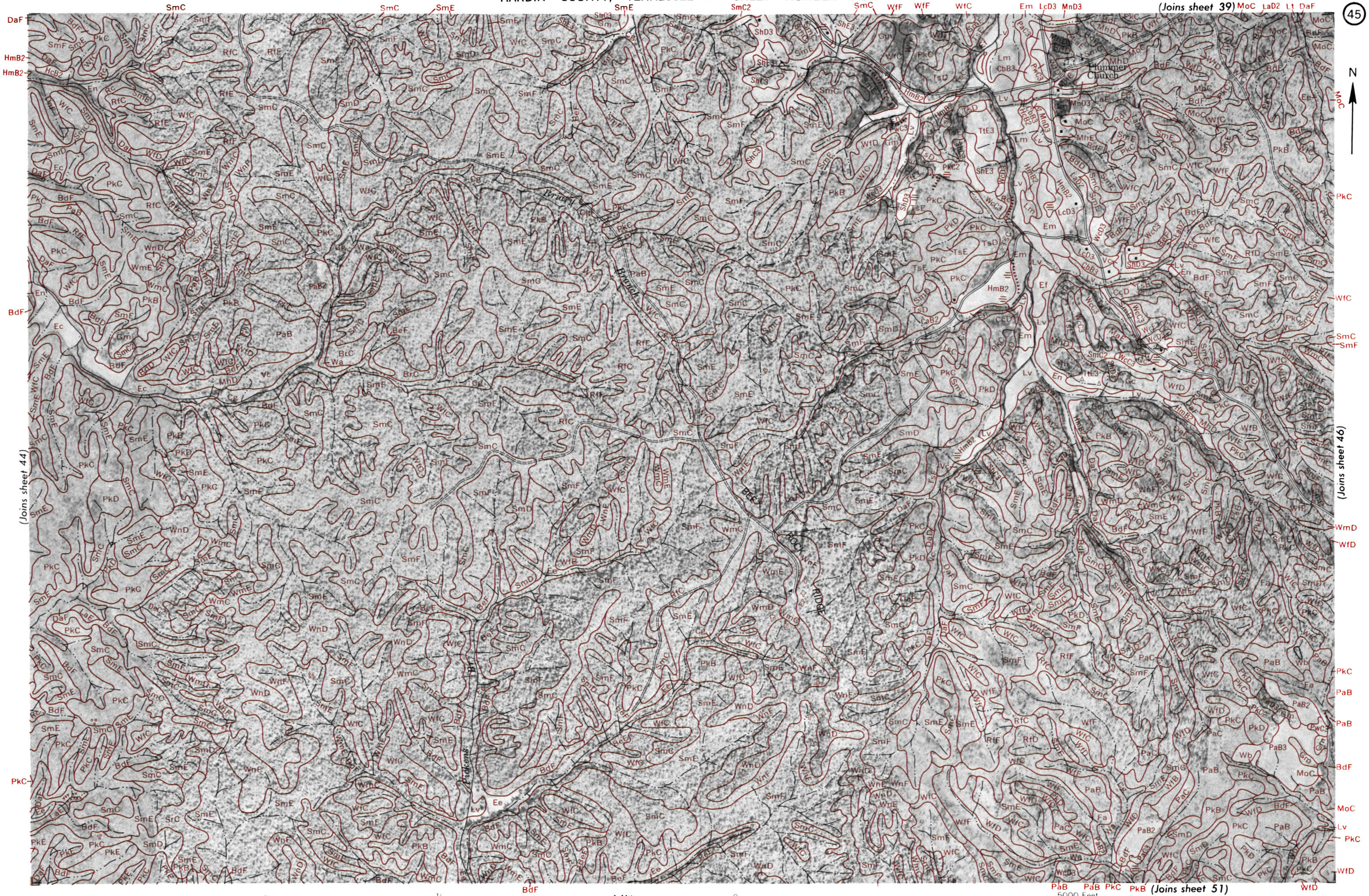


(Joins sheet 45)

(Joins sheet 50)

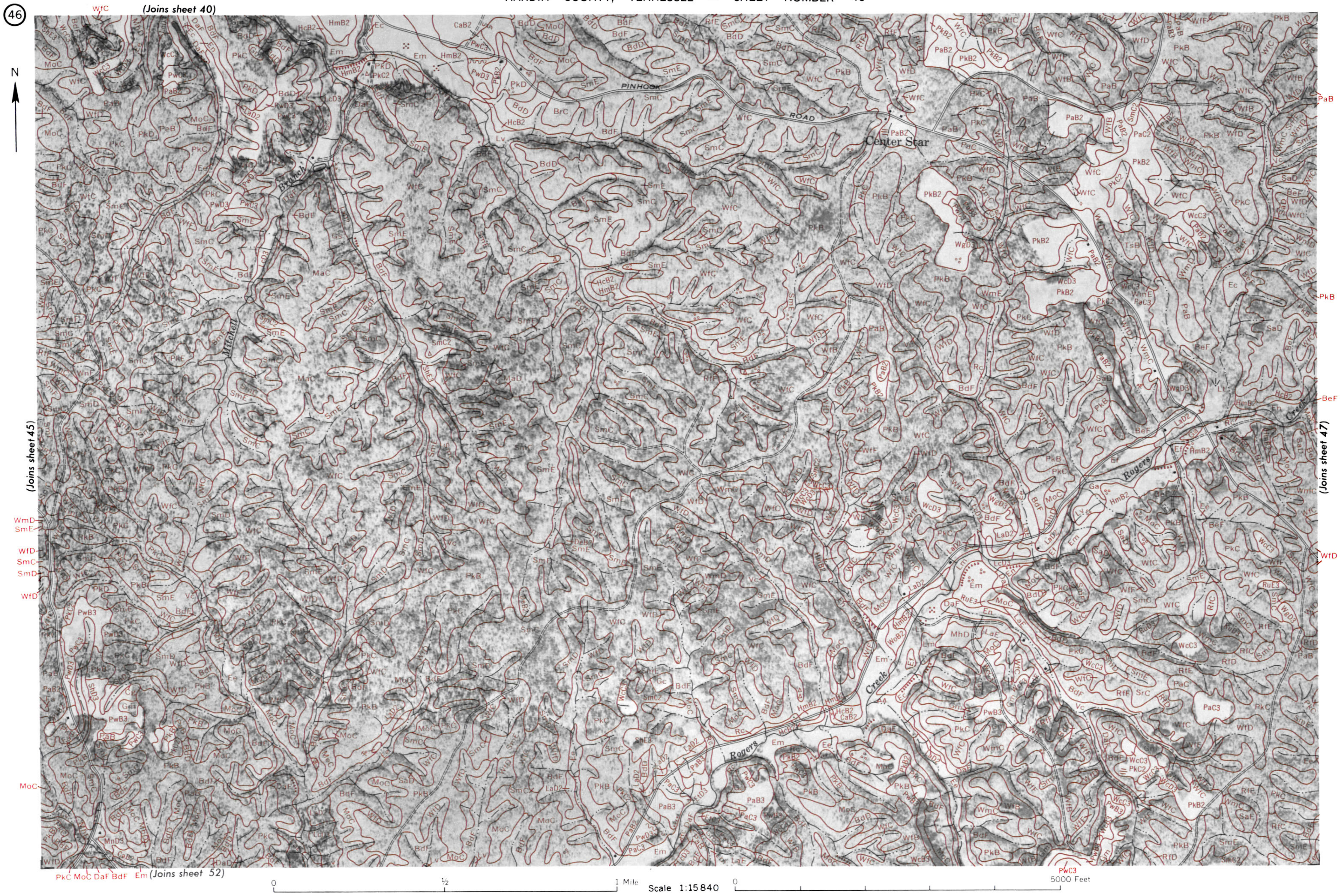
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

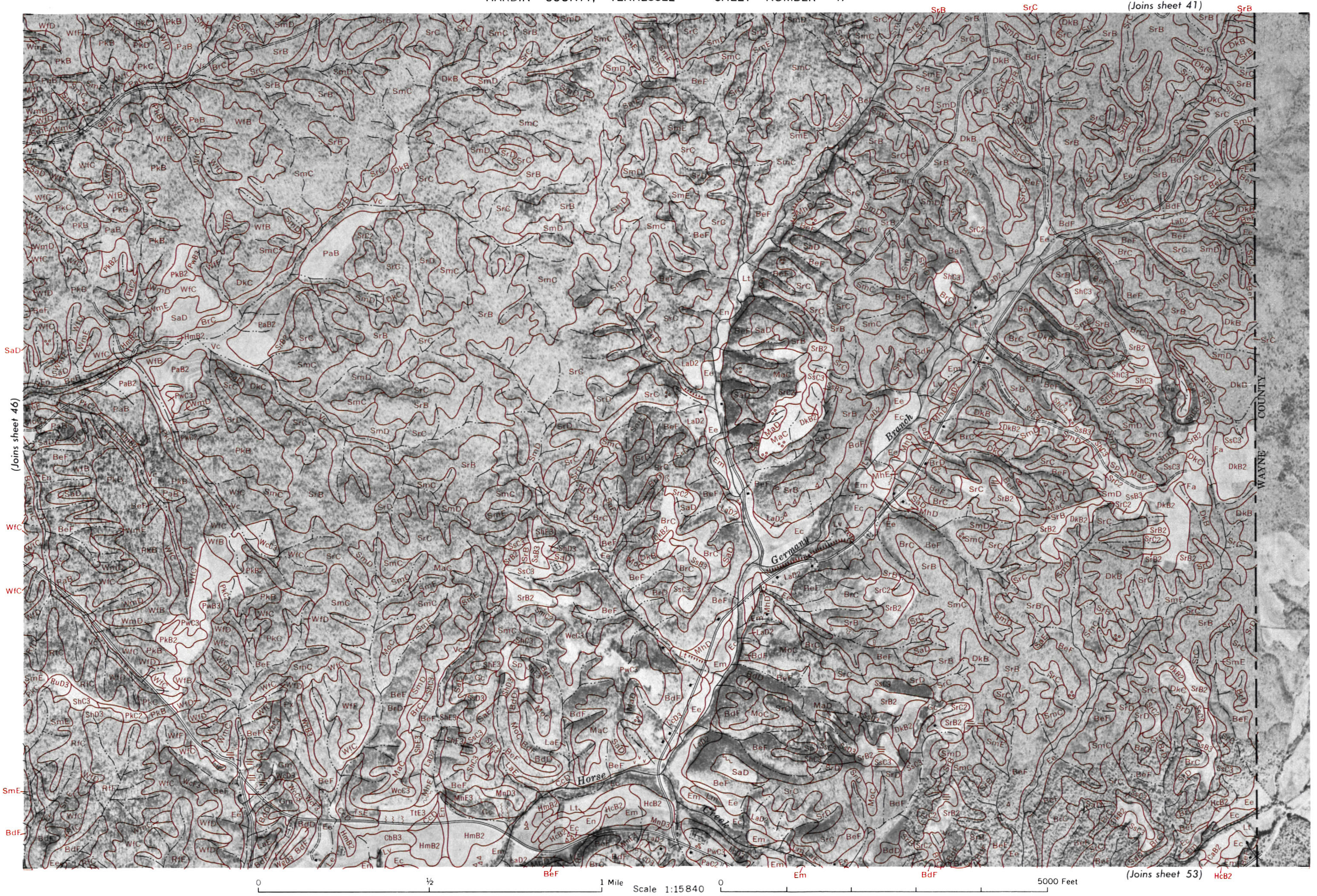
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 45



0 ½ 1 Mile
Scale 1:15840
0 5000 Feet

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.


46
N
(Joins sheet 40)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 52)
PINHOOK
ROAD
Center Star
Branch
Mitchell
Rogers
Creek
Rogers
Creek
0
½
1 Mile
Scale 1:15 840
0
5000 Feet



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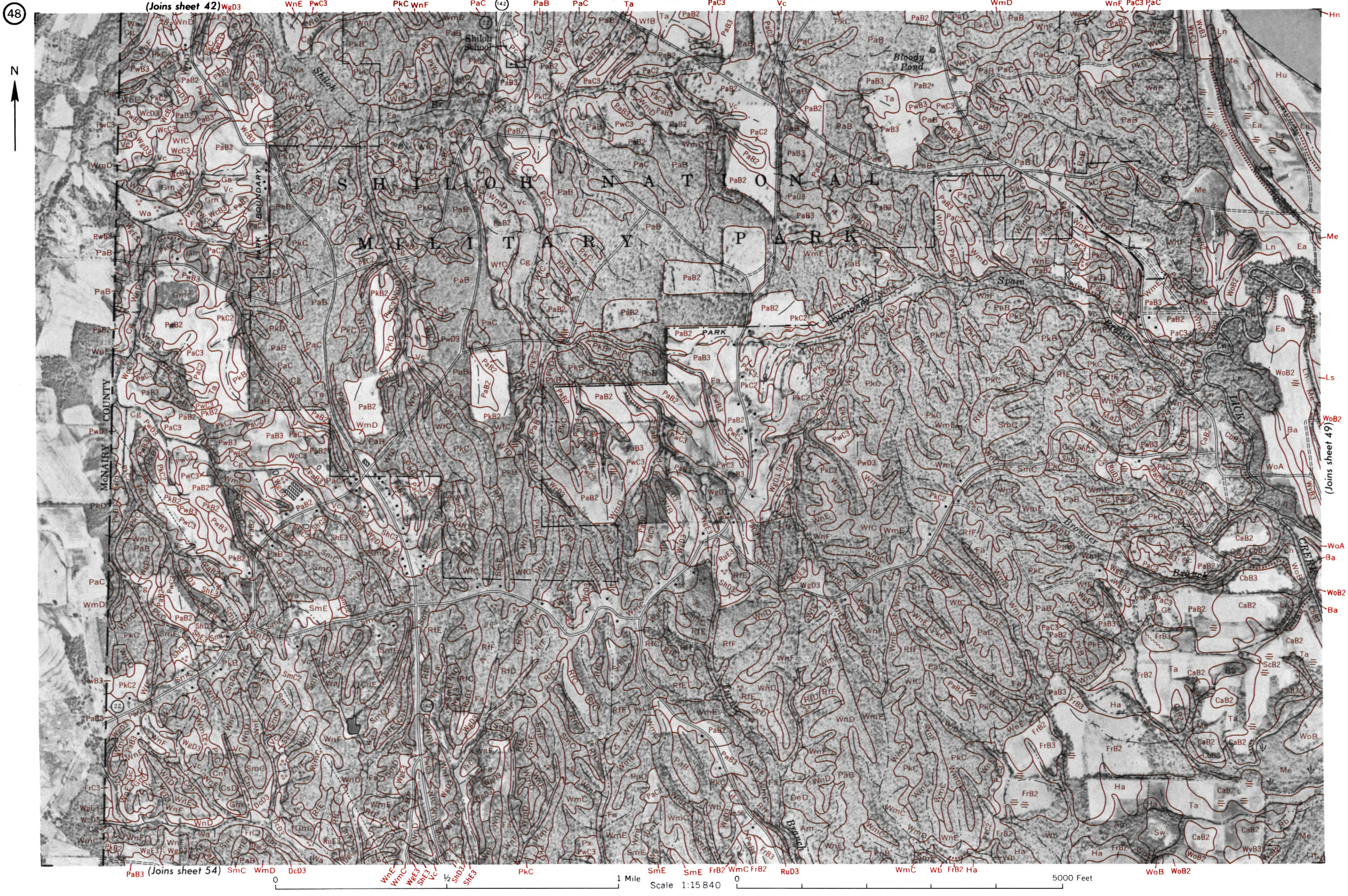
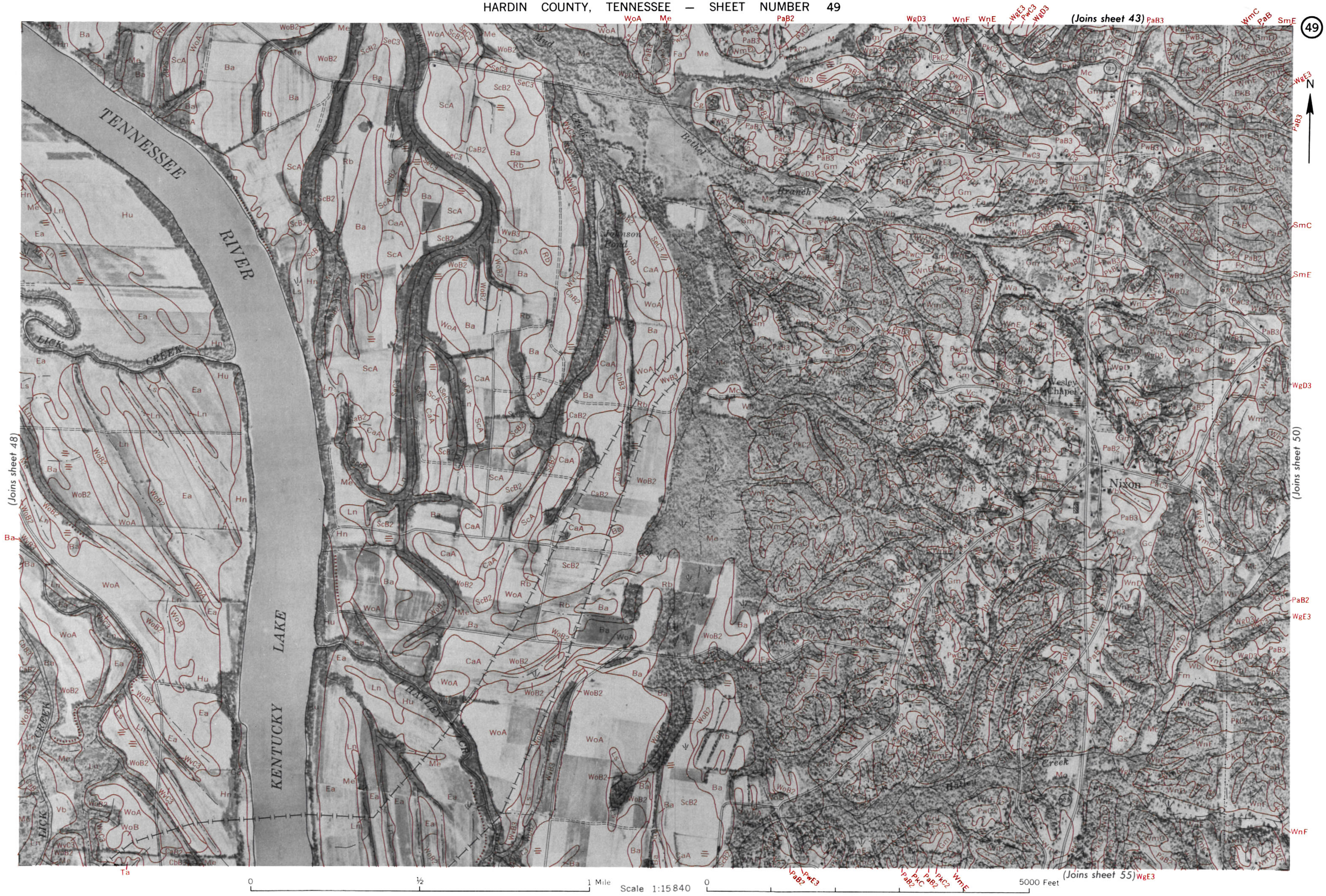
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 48





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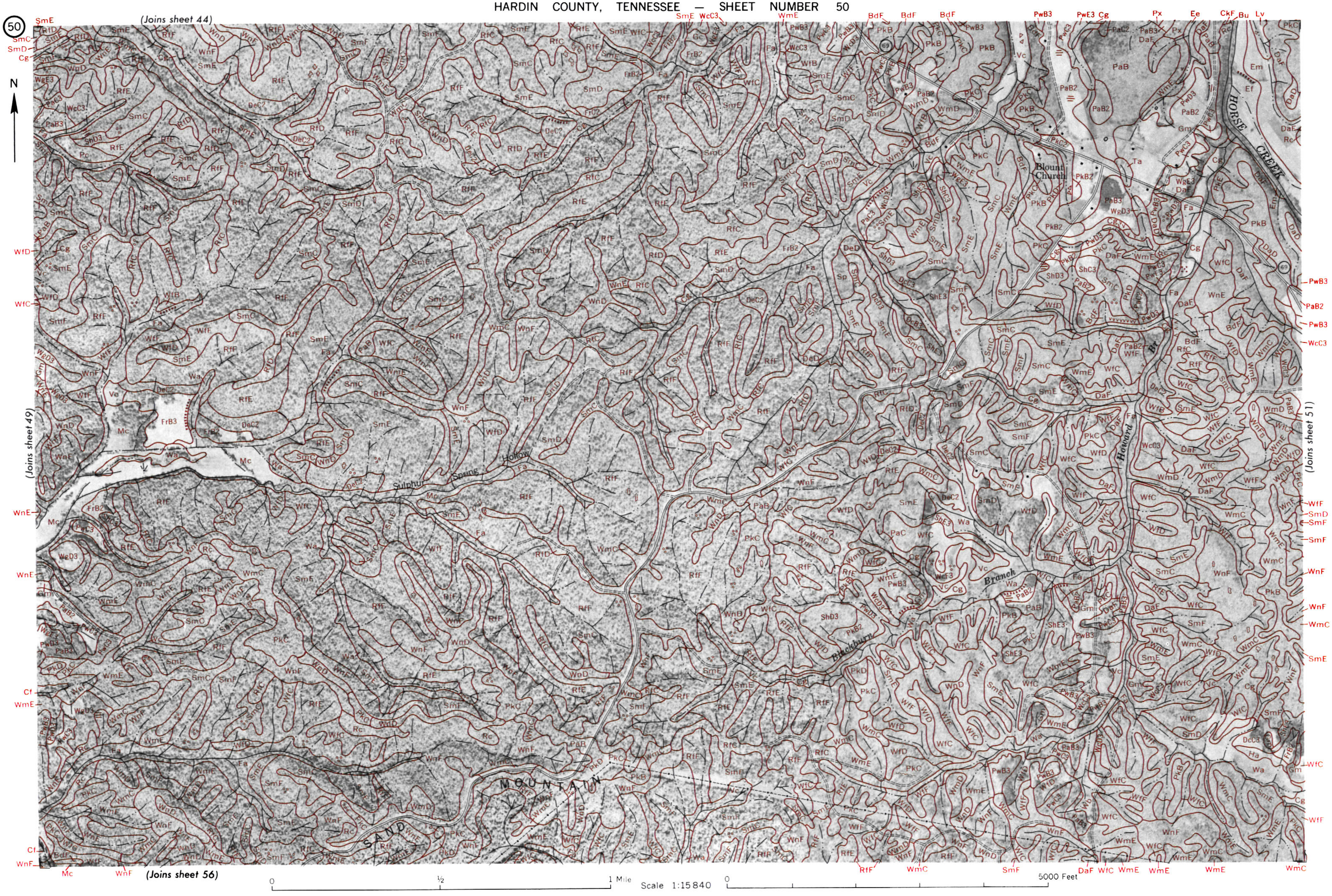
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 50



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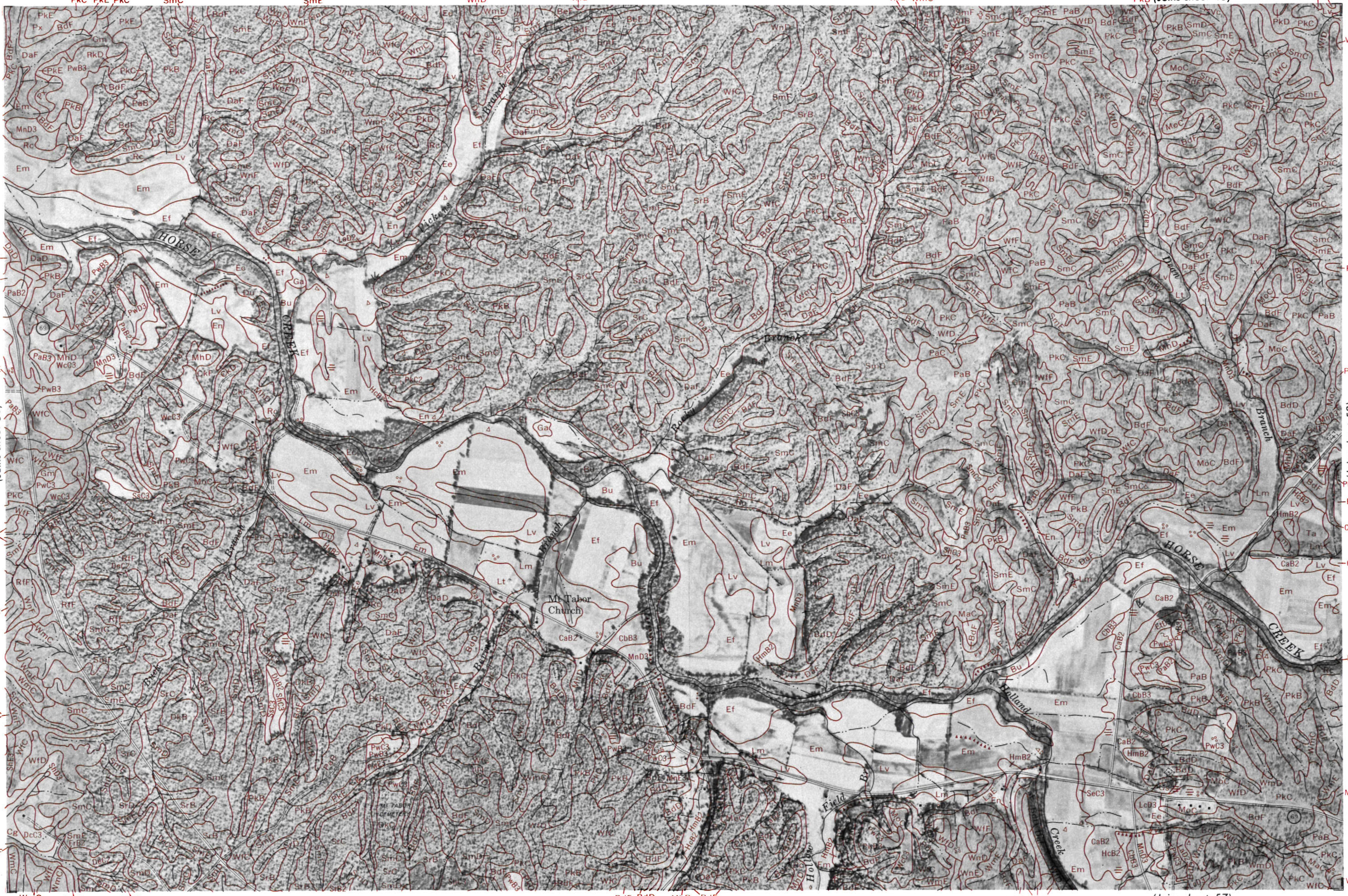


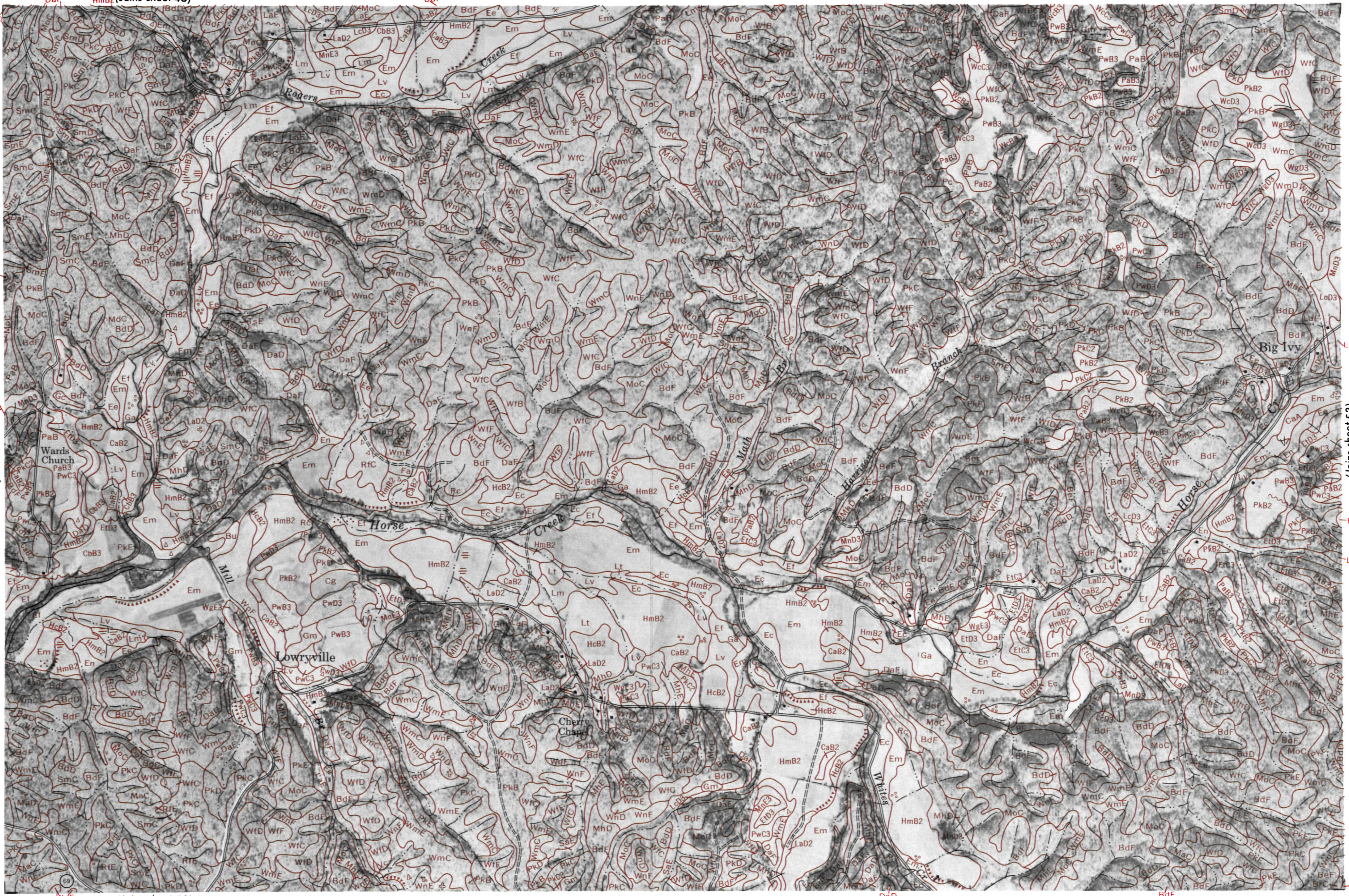
Scale 1:15840

0 ½ 1 Mile

0 5000 Feet

52

(Joins sheet 46)



(Joins sheet 51)

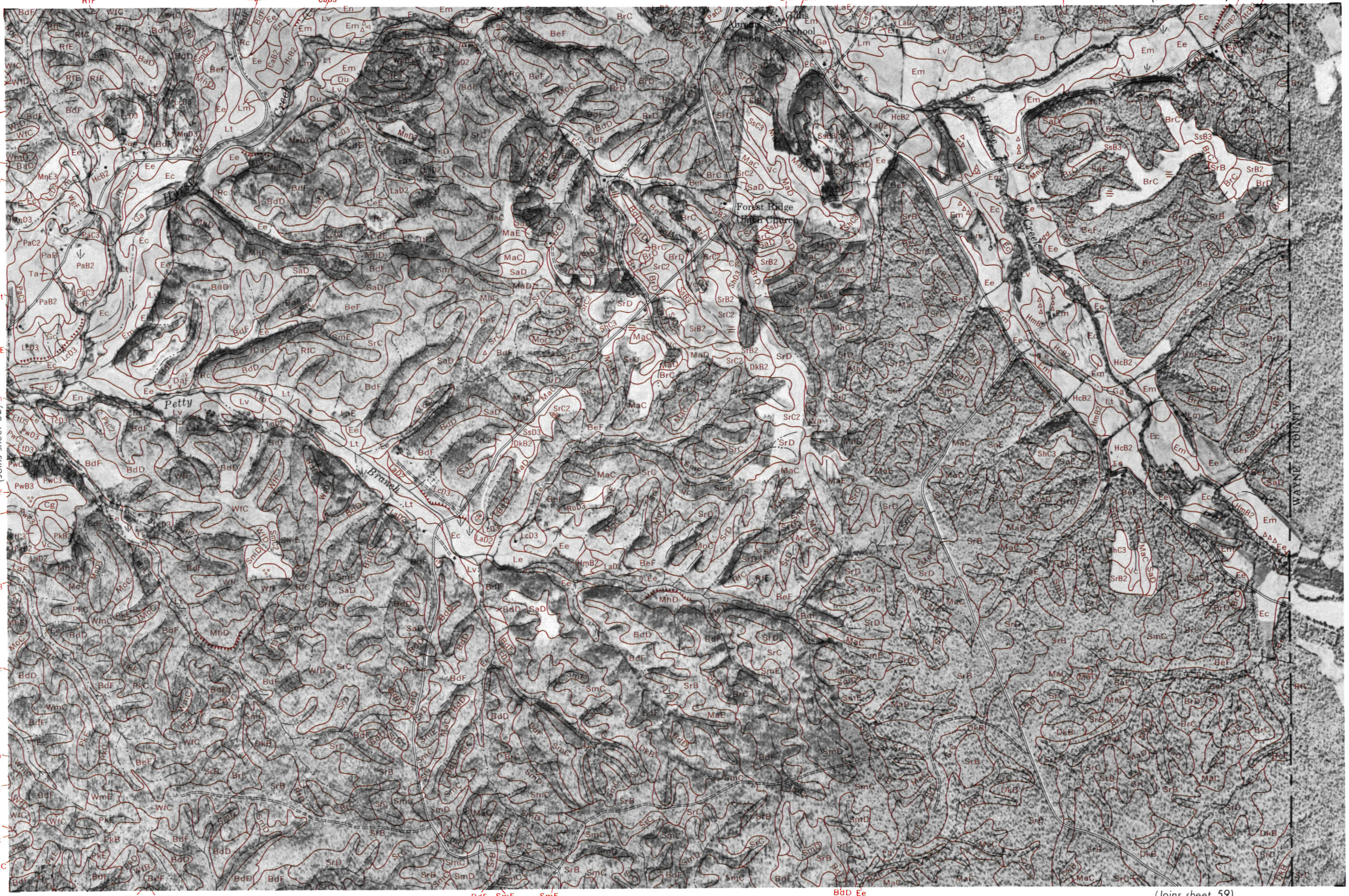
(Joins sheet 53)

(Joins sheet 58)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 47)

(Joins sheet 52)



(Joins sheet 59)

Scale 1:15840

0 ½ 1 Mile

0 5000 Feet

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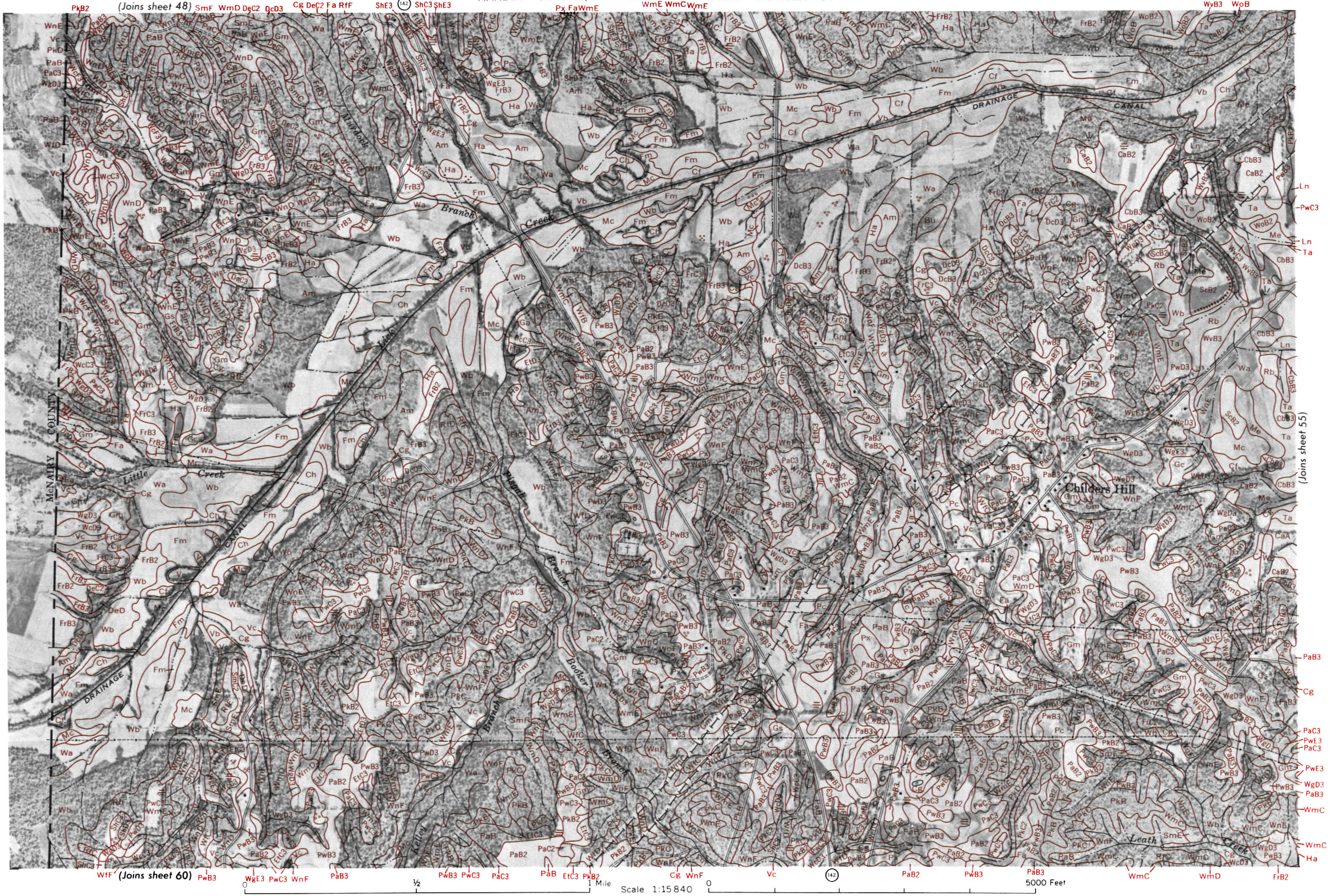
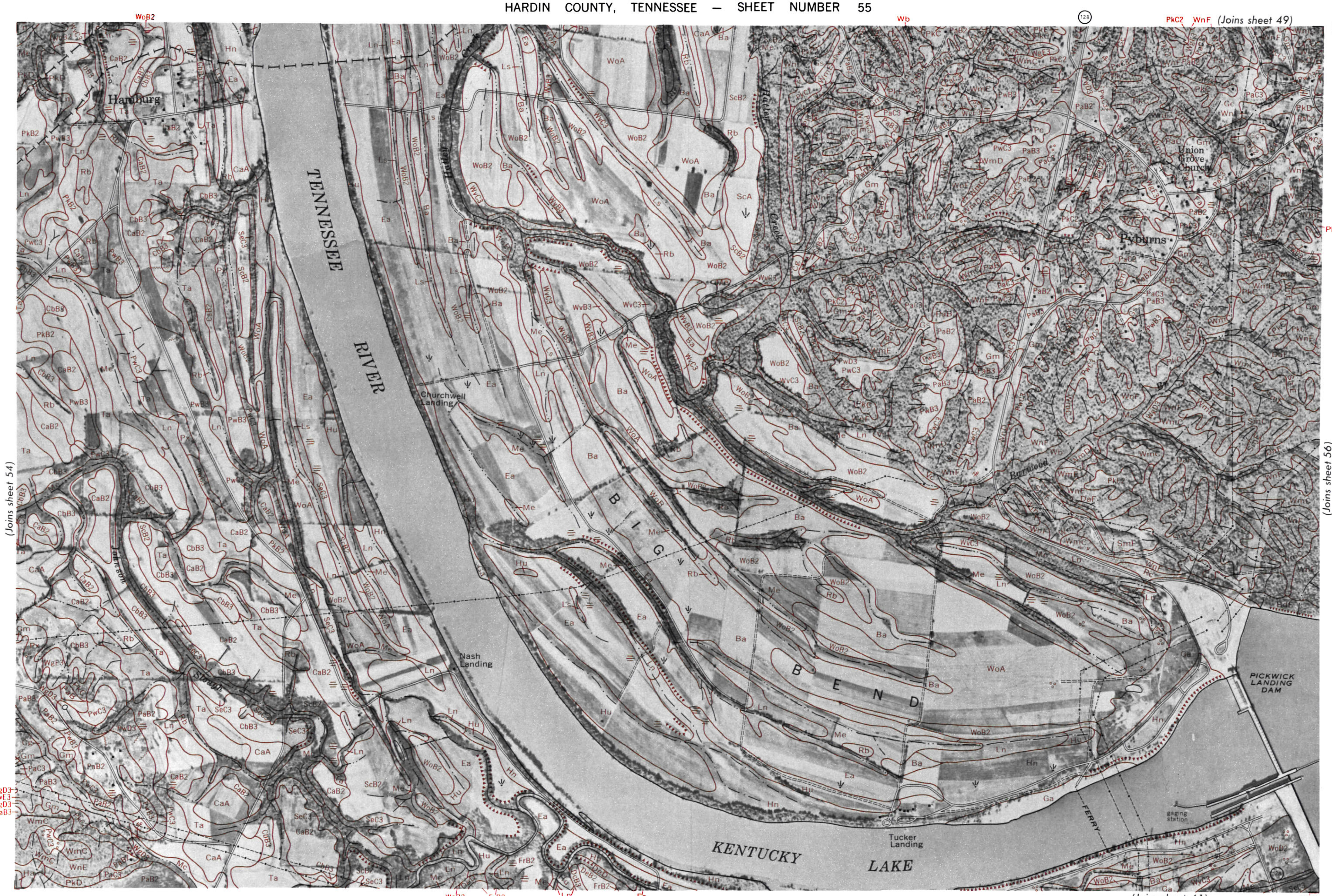
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 54





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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 56

56

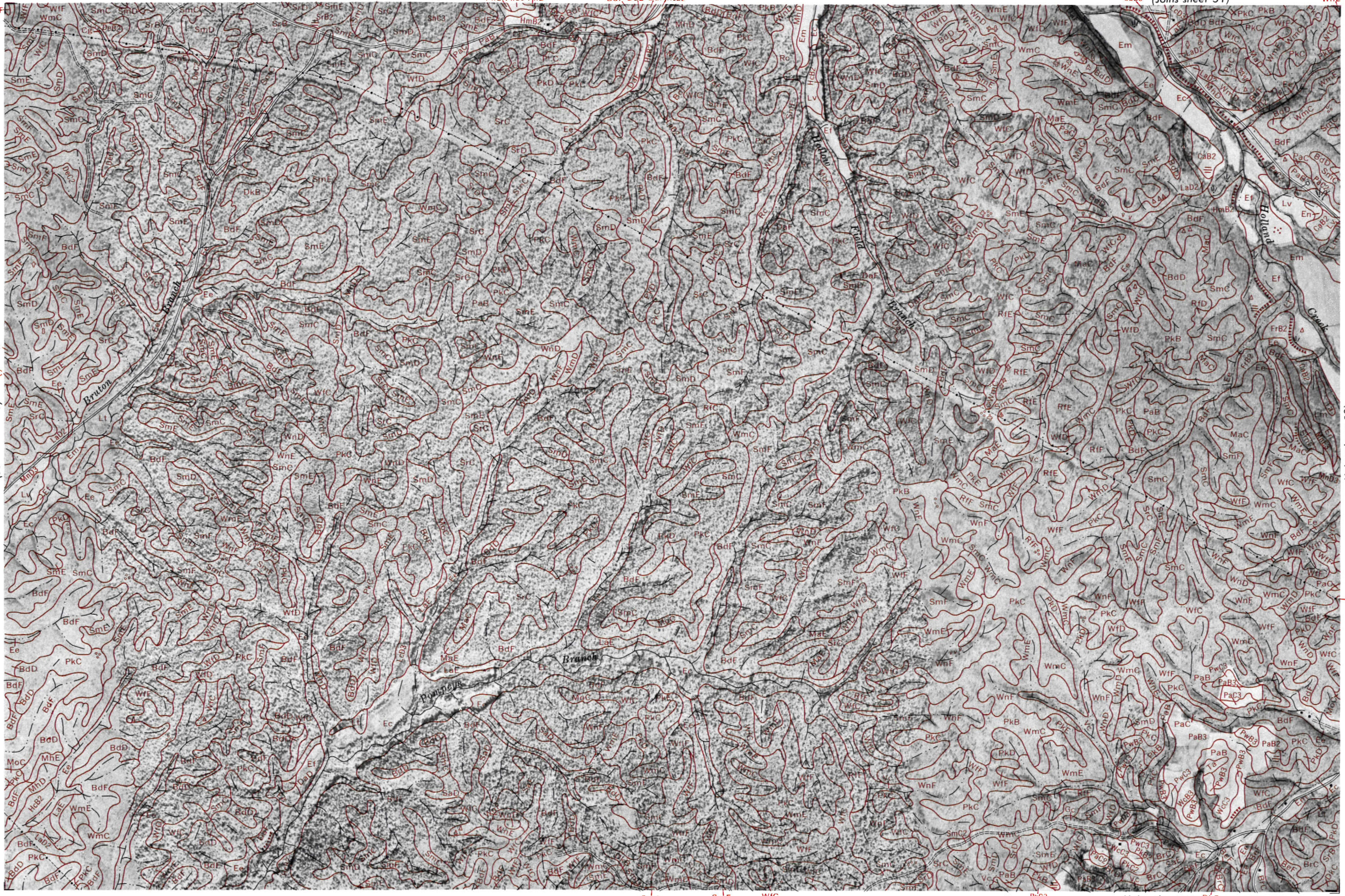
(Joins sheet 50)

(Joins sheet 55)

(Joins sheet 57)

(Joins sheet 62)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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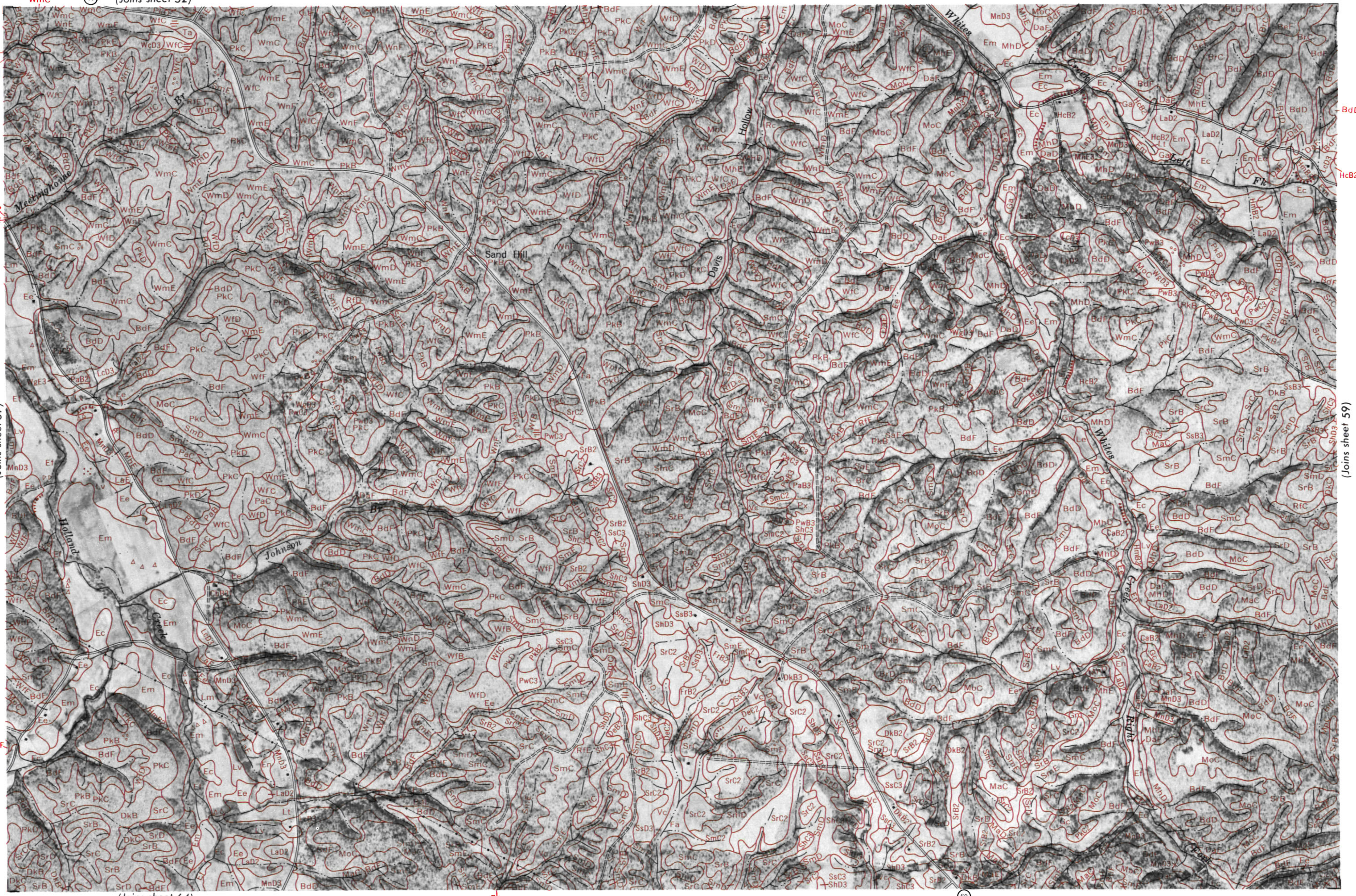
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 58

(Joins sheet 52)



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(Joins sheet 59)

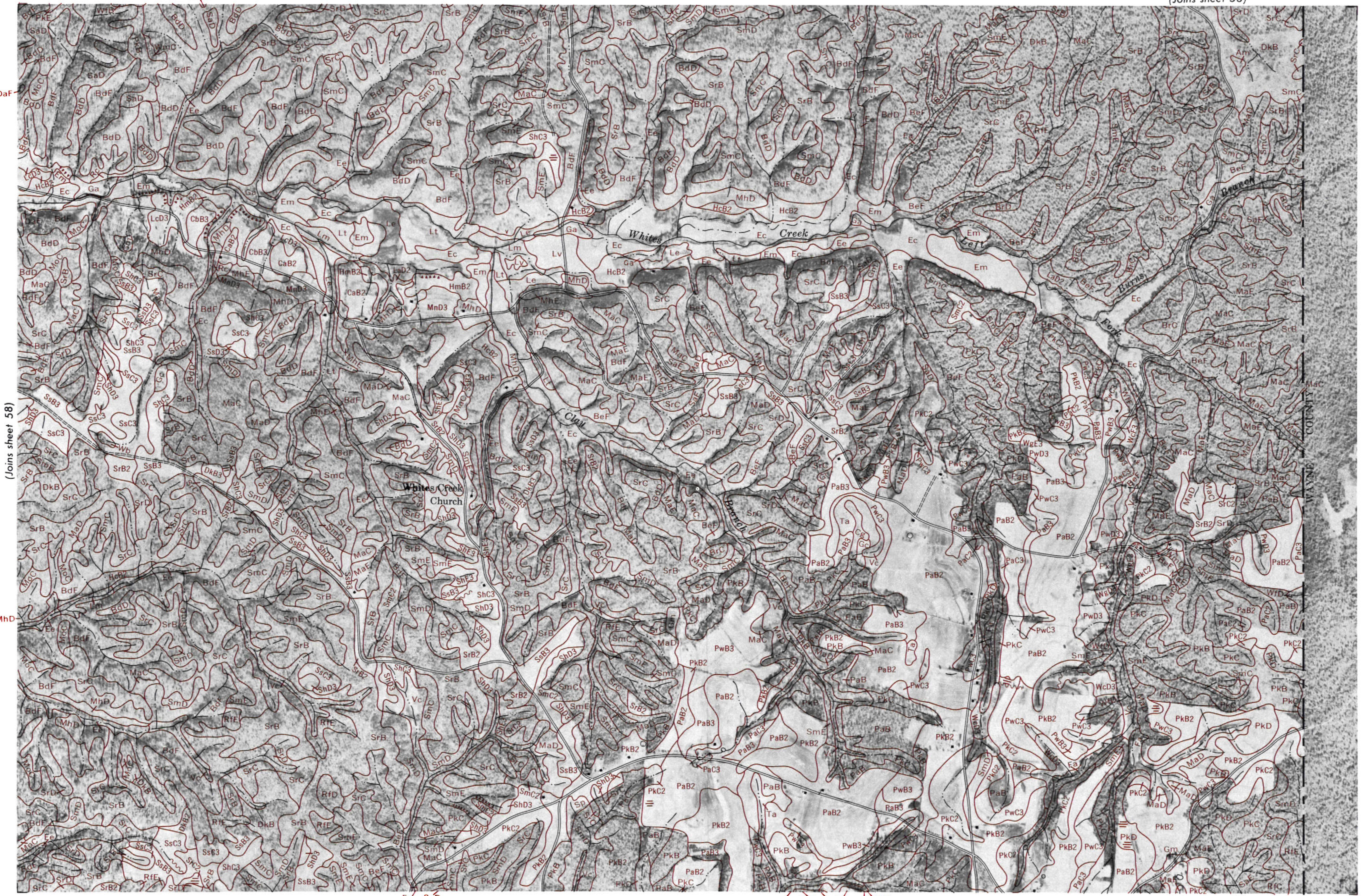
(Joins sheet 64)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

N

(Joins sheet 53)

(Joins sheet 58)



(Joins sheet 65)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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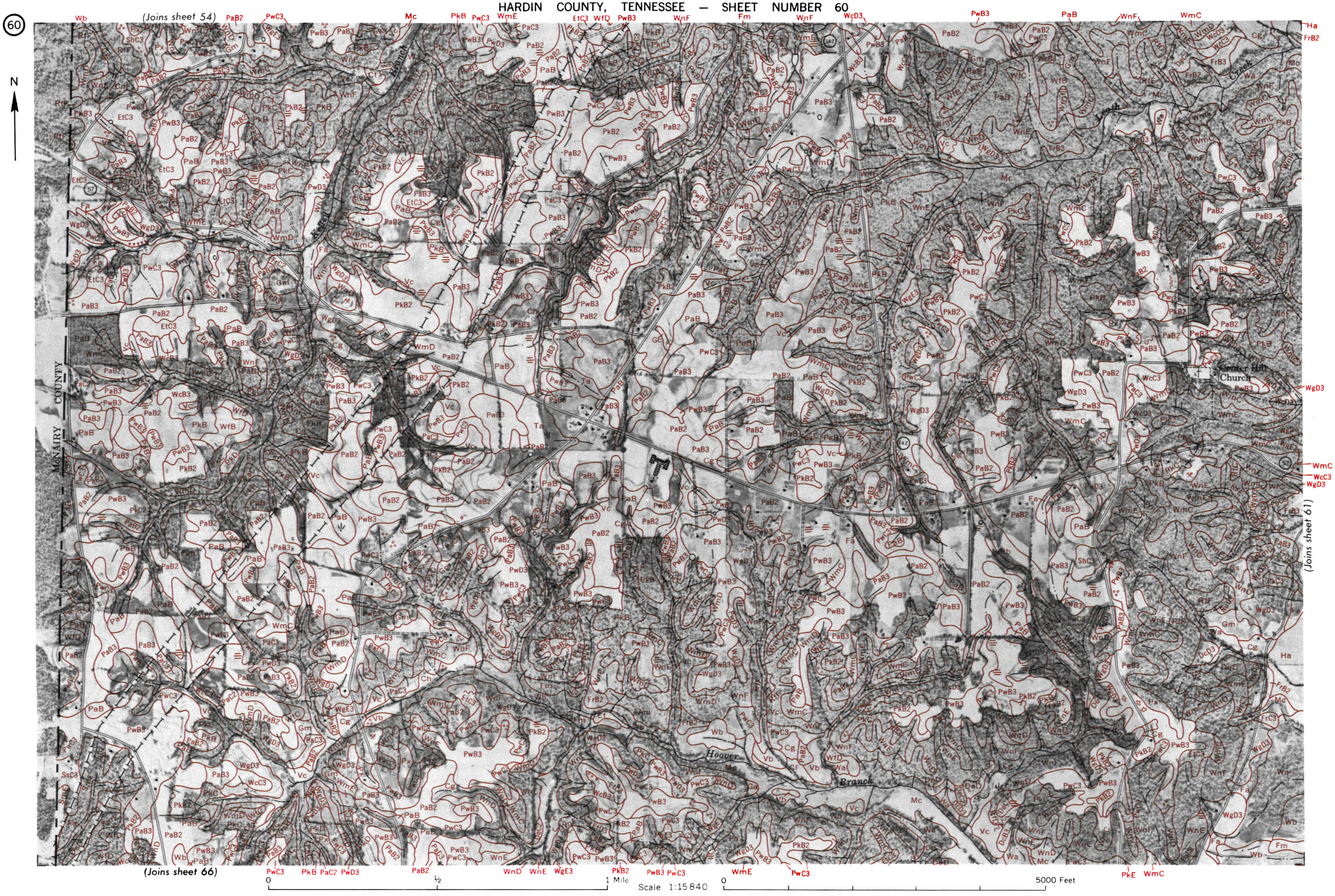
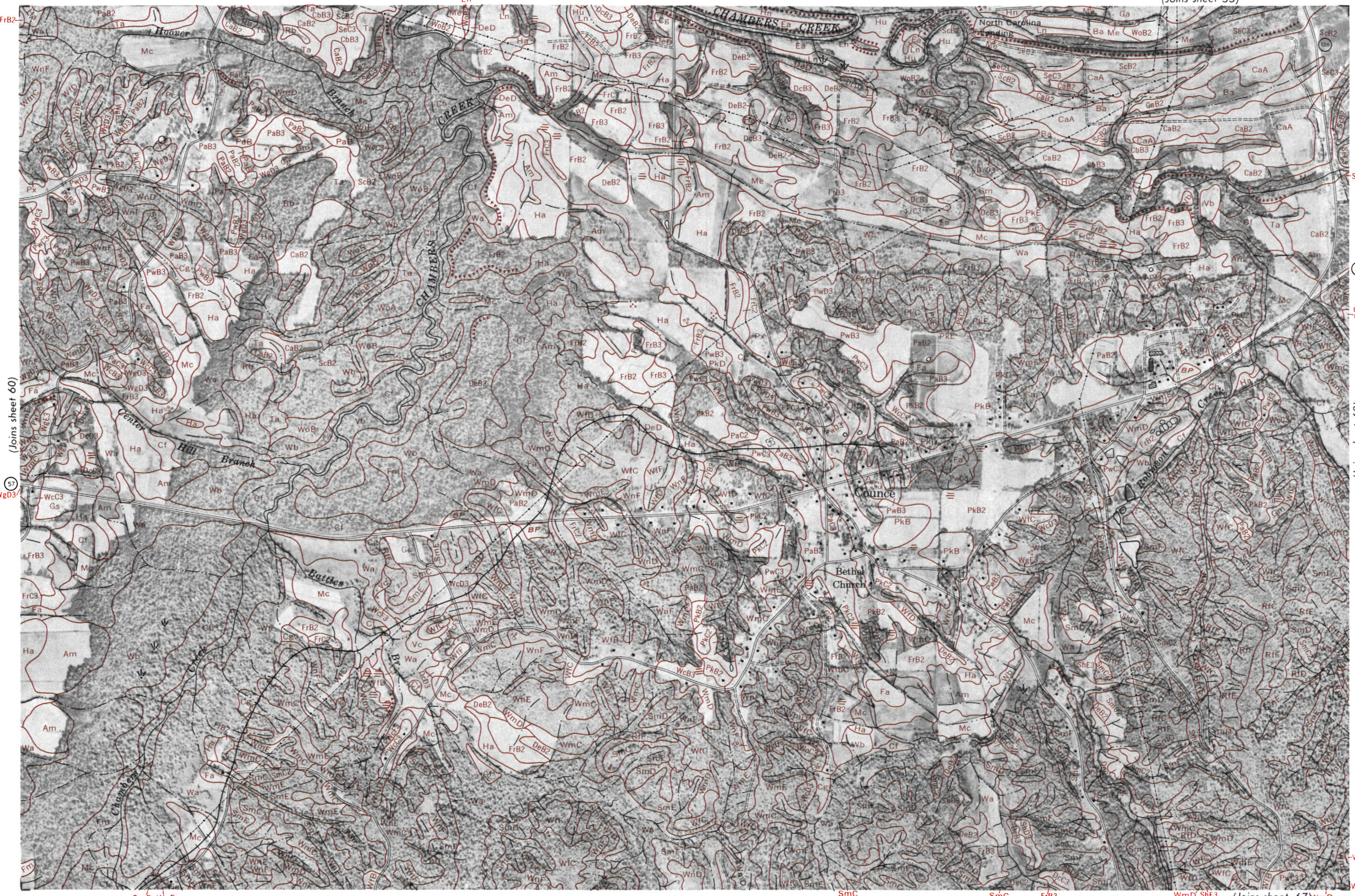
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 60



HARDIN COUNTY, TENNESSEE — SHEET NUMBER 61

61



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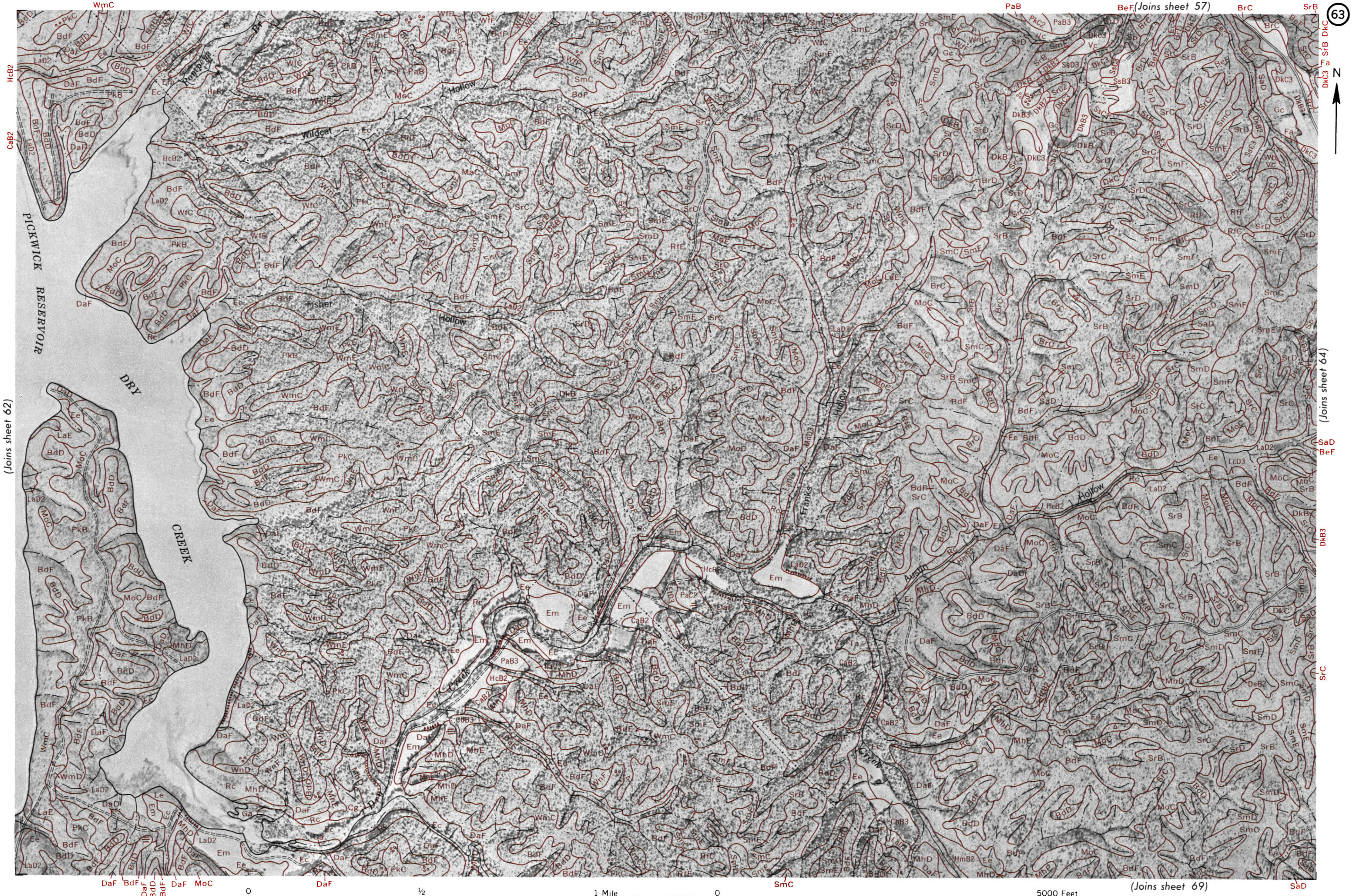
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 56)

(Joins sheet 68)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

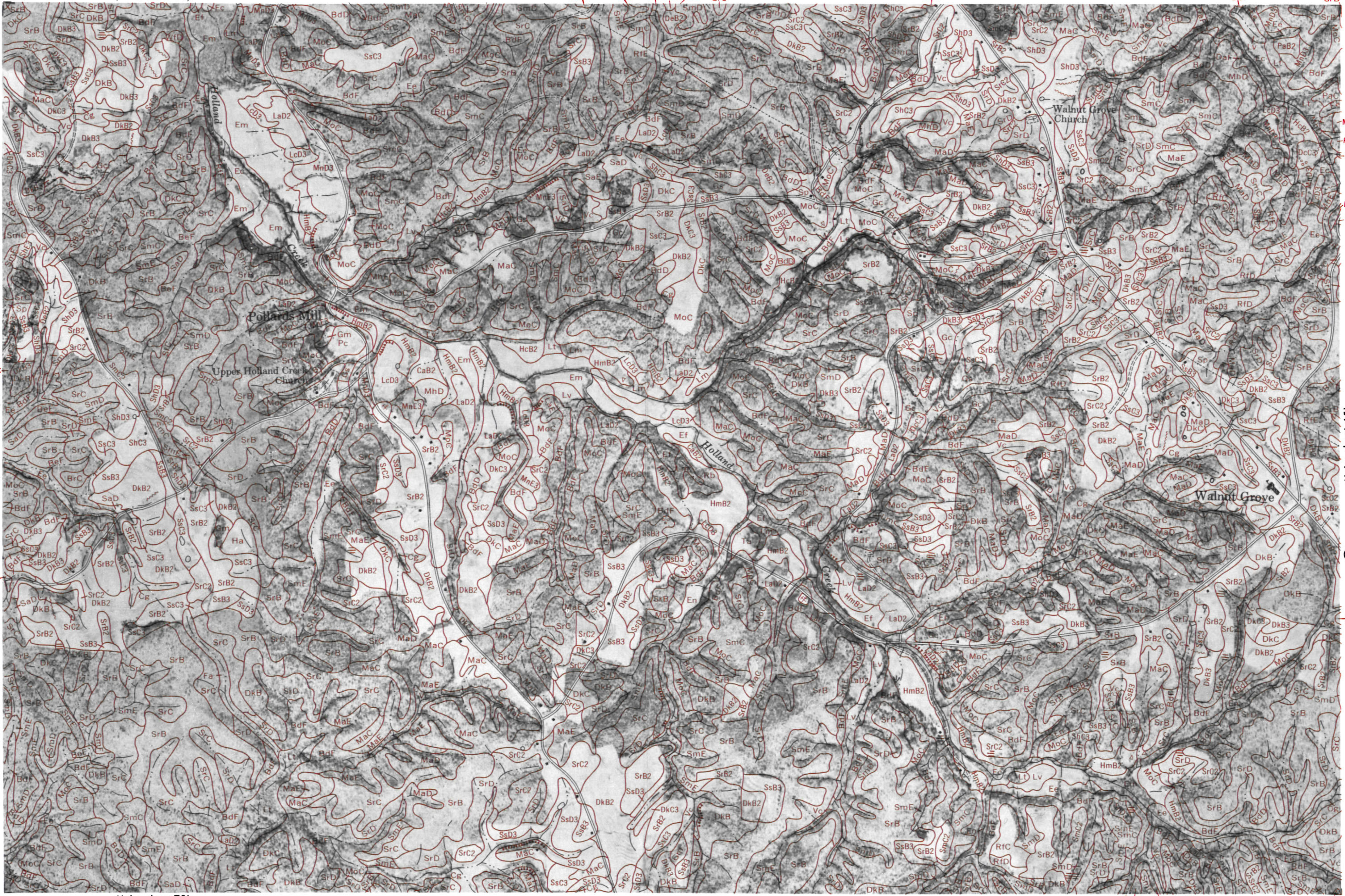


0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 64

(Joins sheet 58)

(Joins sheet 63)



(Joins sheet 65)

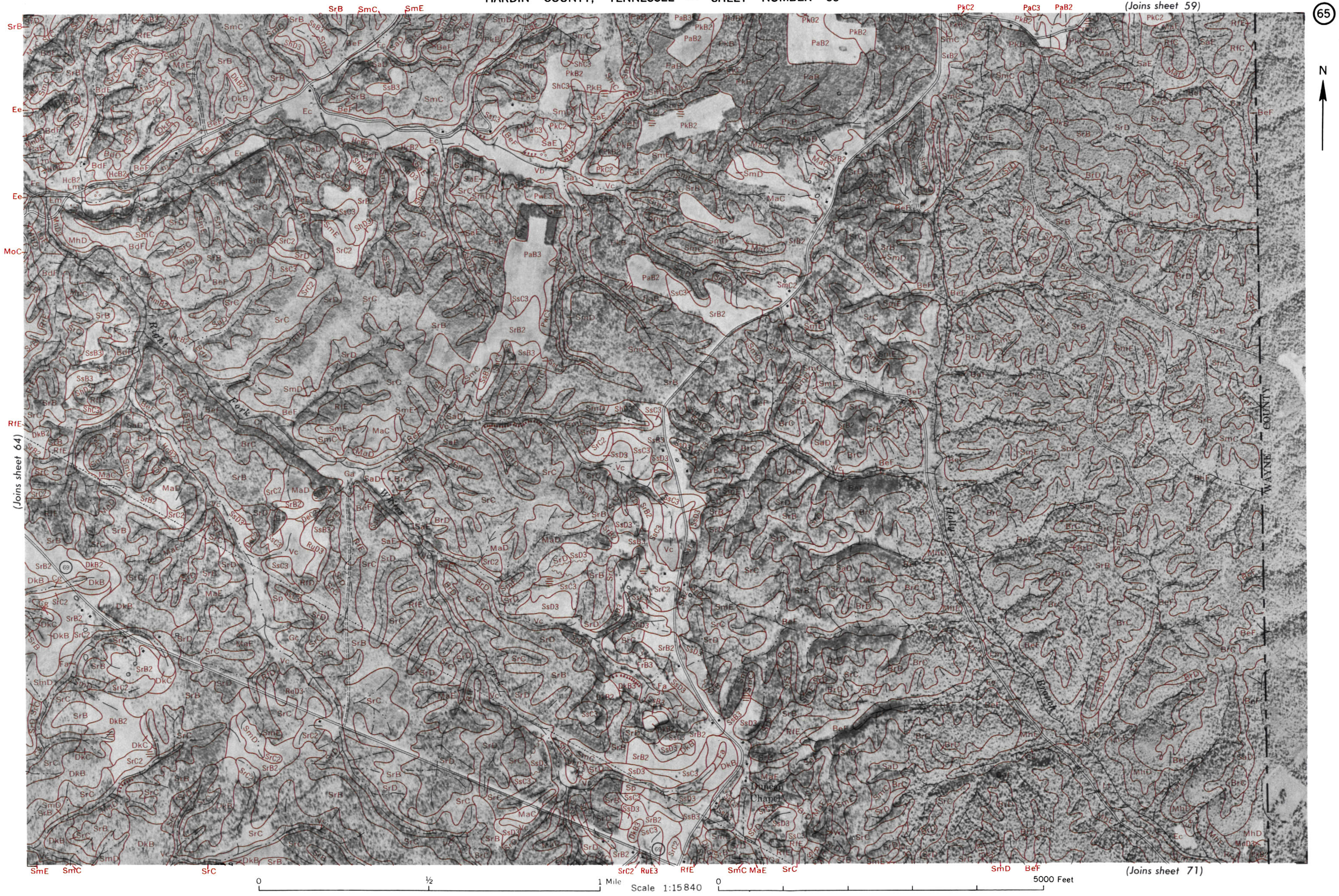
(Joins sheet 70)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

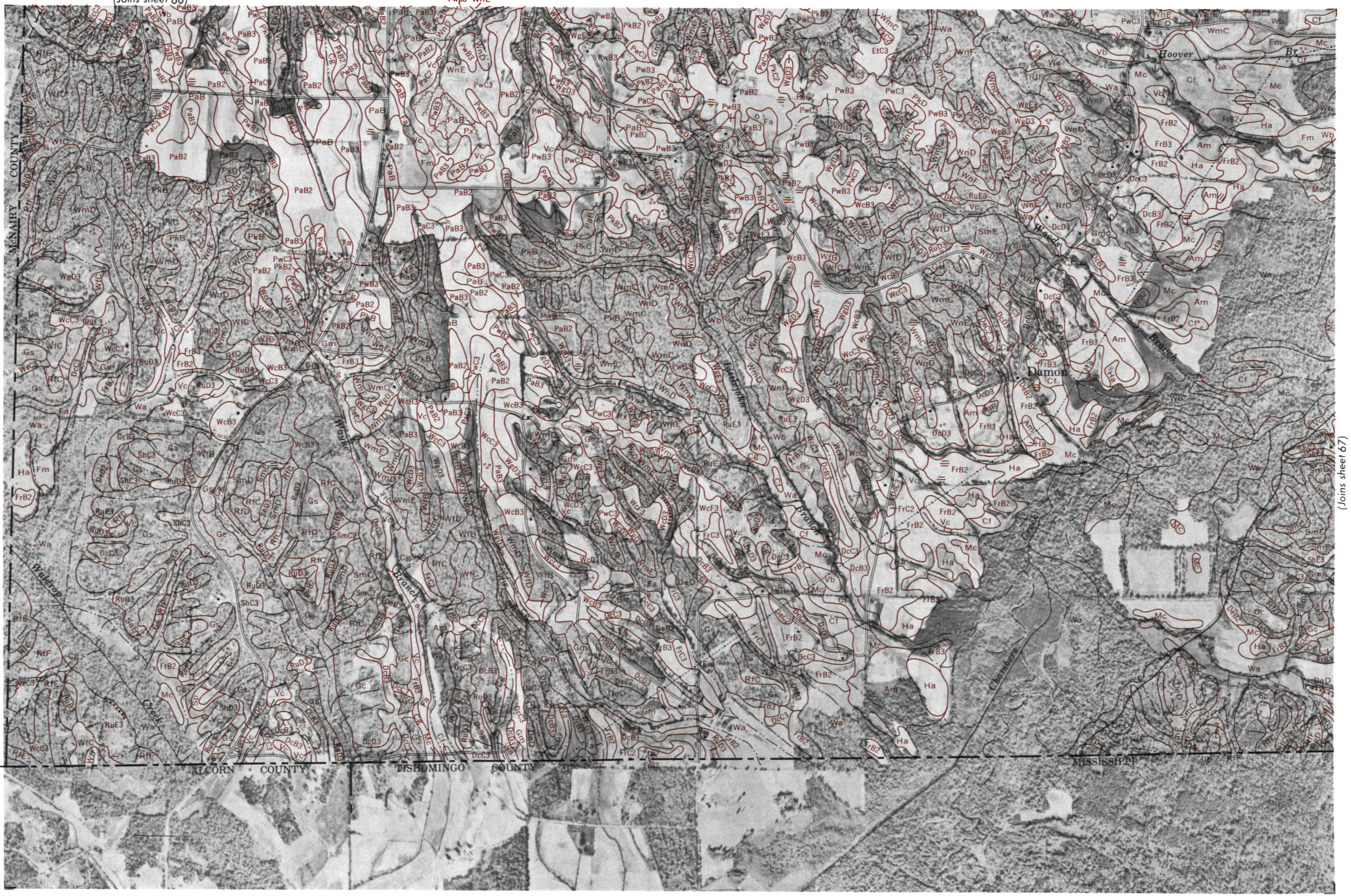
HARDIN COUNTY, TENNESSEE — SHEET NUMBER 65

65

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1955.



HARDIN COUNTY, TENNESSEE — SHEET NUMBER 66



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 67

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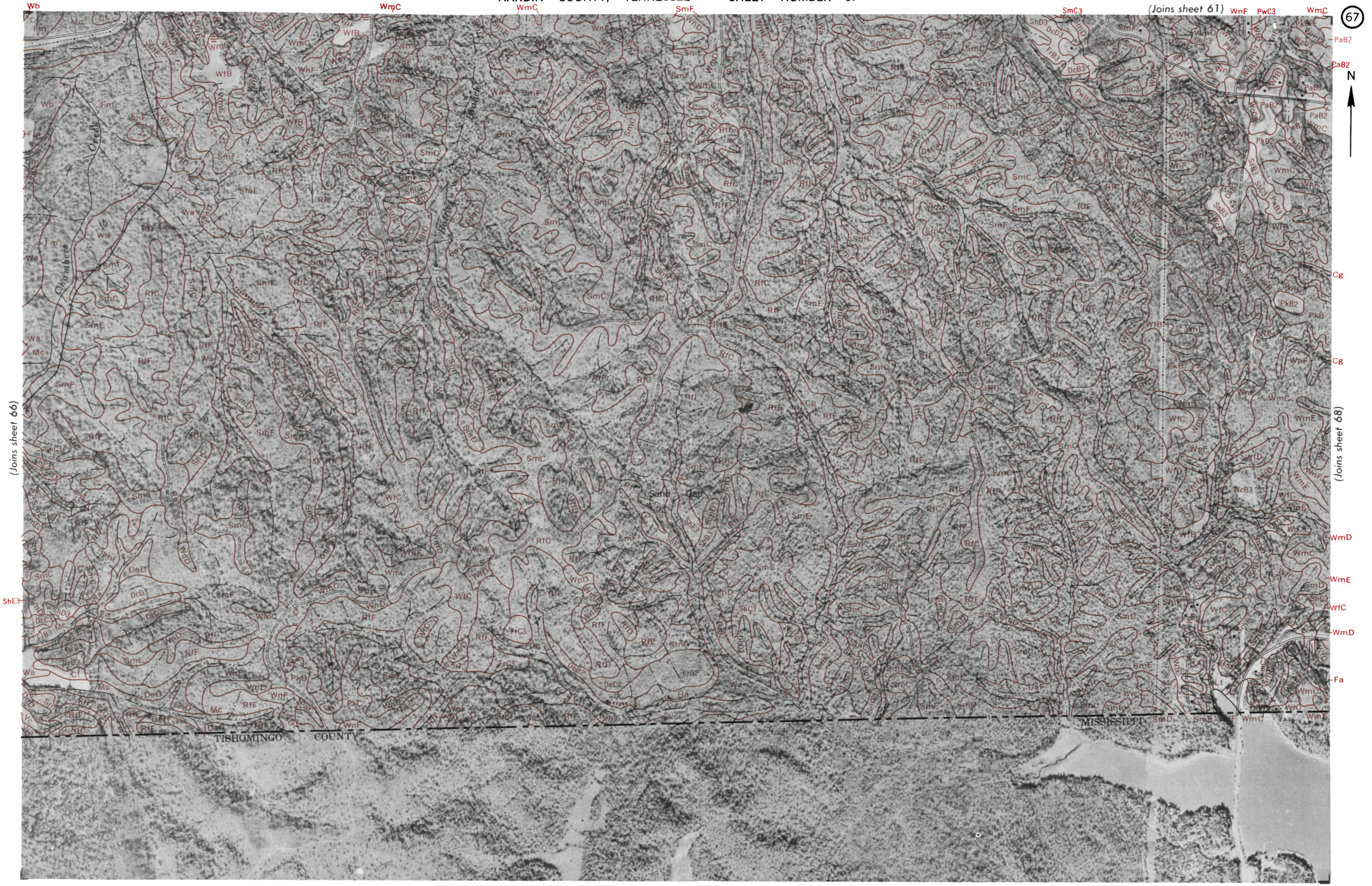
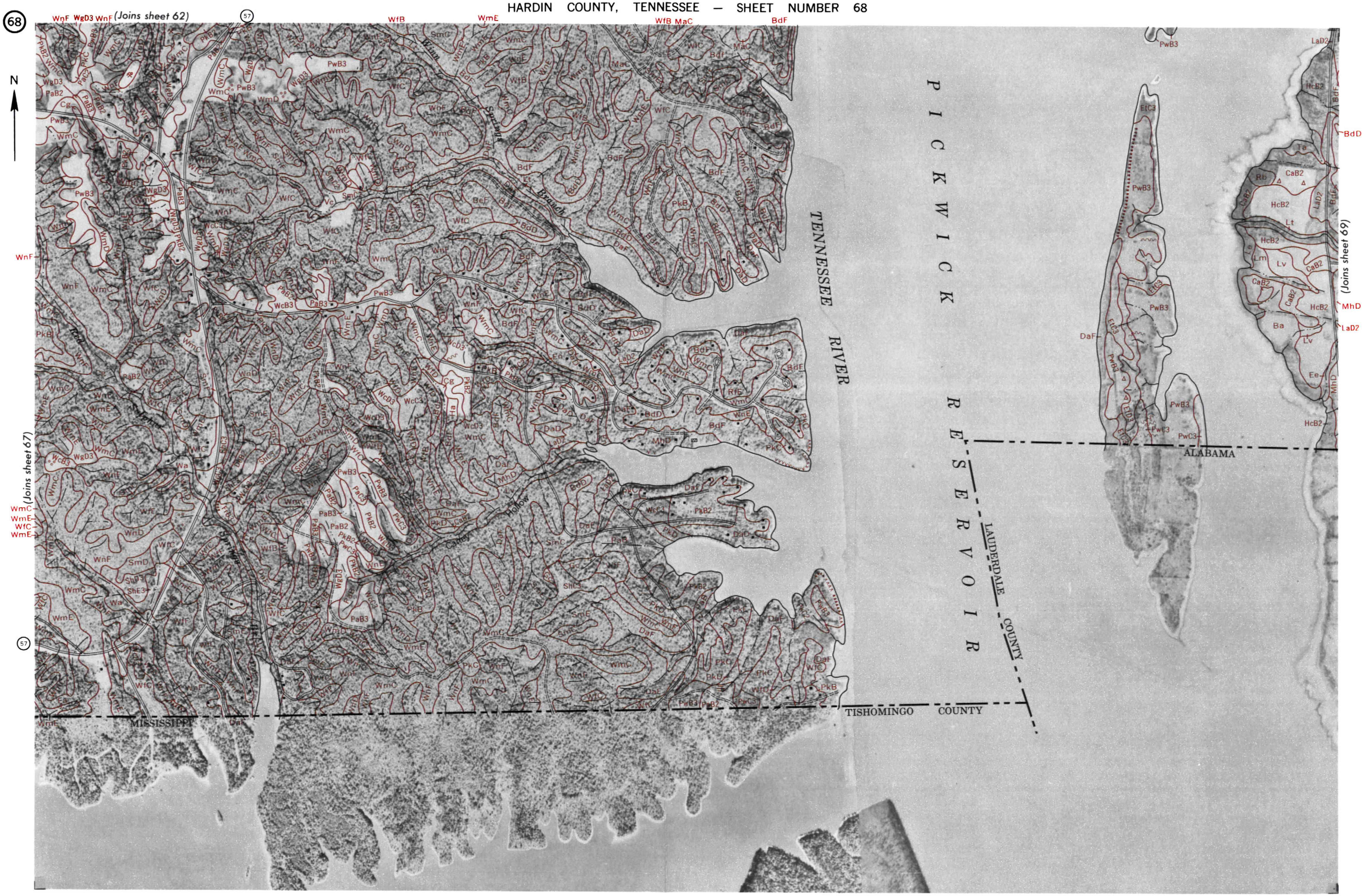


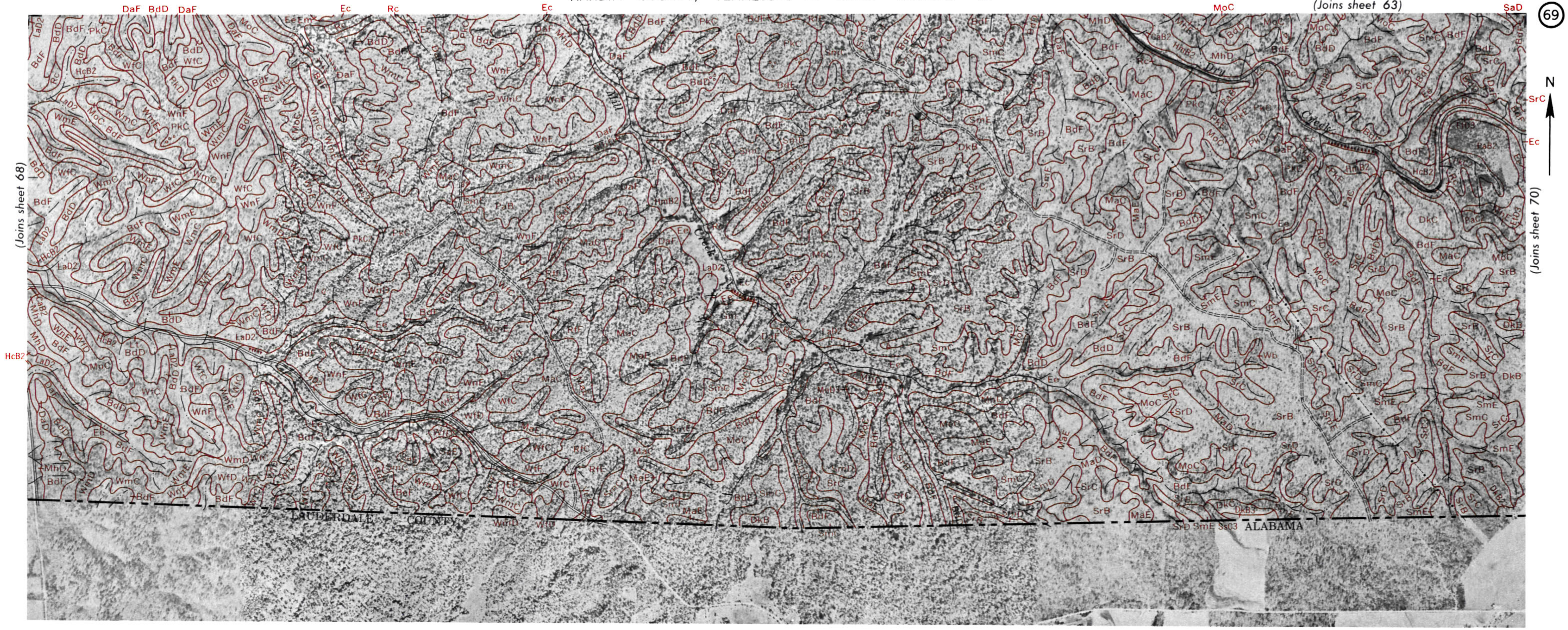
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 68



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

69



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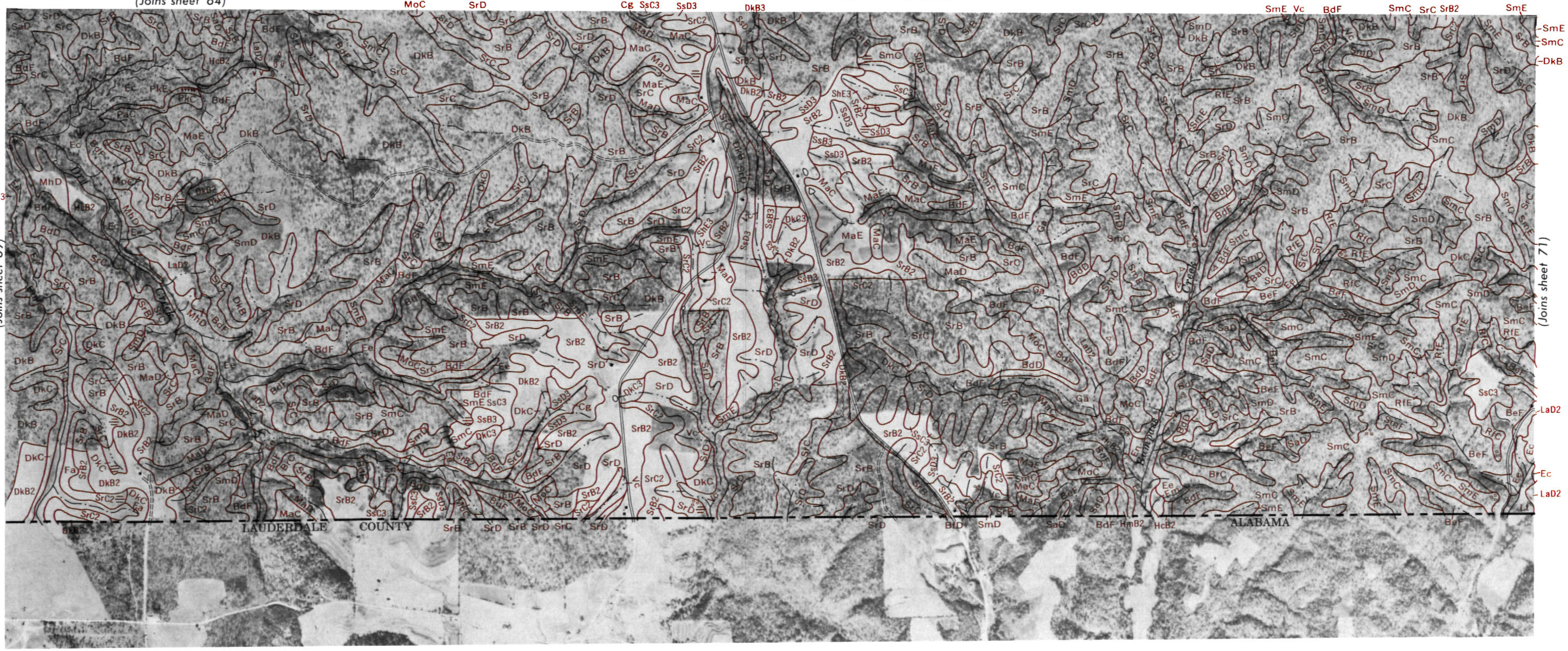
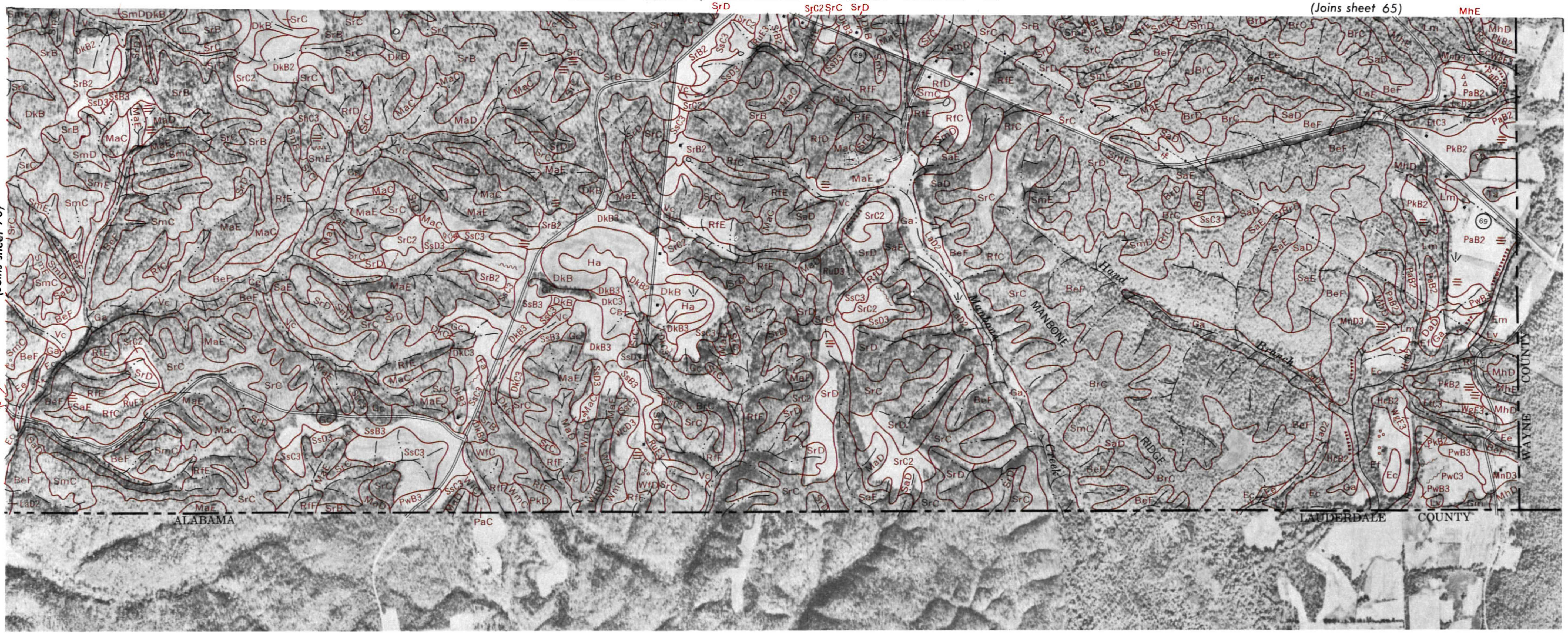
0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE — SHEET NUMBER 70

70



0 ½ 1 Mile Scale 1:15840 0 5000 Feet



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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

HARDIN COUNTY, TENNESSEE

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Station

Mines and Quarries

Mine dump

Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Oil wells

Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.
  - Crossable with tillage implements
  - Not crossable with tillage implements

Canals and ditches (CANAL, DITCH)

Lakes and ponds
- Perennial
- Intermittent

Wells (flowing)

Springs

Marsh

Wet spot

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions (Large, Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies
- Borrow Pit (BP)